

FURTHER TACTICAL NUCLEAR WEAPONS REDUCTIONS IN EUROPE: THE NEXT CHALLENGE FOR ARMS CONTROL

**A MONOGRAPH
BY**

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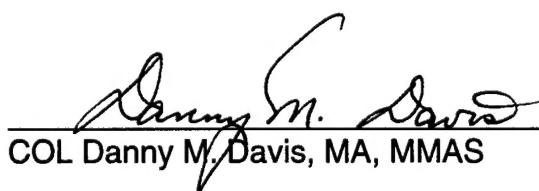
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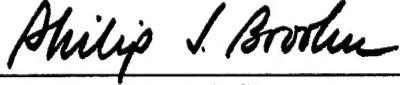


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ABSTRACT

FURTHER TACTICAL NUCLEAR WEAPONS REDUCTIONS IN EUROPE: THE NEXT CHALLENGE FOR ARMS CONTROL, by Maj Thomas Y. Headen, USAF, 66 pages.

The dissolution of the Warsaw Pact and Soviet Union has removed the traditional Cold War logic and security rationale for the forward deployment of theater nuclear weapons (TNWs) in Europe. Moreover, with a reduction of almost 90 percent of US TNWs from NATO's soil, the debate continues on whether or not there still exists such a requirement, as well as making it more difficult for key decisionmakers to clearly articulate their future relevance. Based on these conditions, the research question for this monograph is to determine what creative steps, proposals or measures would merit consideration and help jump-start dialogue between the US and Russia for deeper reductions in their TNW stockpiles, as well as to define the associated issues, obstacles and challenges. Both the US and Russia's histories are replete with successful arms control examples. So surely both sides can look to their past to find prescriptions of how to deal with the development of disarmament measures that can be undertaken to generate the needed debate necessary to lead to the institution of new arms control measures and agreements, as well as preserve a credible, effective deterrent in the face of growing challenges to maintaining a stable European security environment and strategic relationship in the years to come.

The monograph begins with an historical review on the evolution of NATO's nuclear strategy, focusing almost exclusively on the conditions that warranted the introduction and employment of TNWs into Europe. Additionally, it will highlight some of the economic and national security influences that led to changes in NATO's nuclear strategy and the development of policies that carefully linked TNWs to strategic nuclear weapons to reassure a US commitment to Europe and provide decisionmakers greater flexibility through multiple options to respond to any aggression. It will also describe the geopolitical landscape subsequent to announced 1991 and 1992, US and Russian arms reduction declarations.

Next, the monograph carefully examines NATO's threat environment and possible responses. Considerations will concentrate on two principal threats—Russia and the proliferation of Weapons of Mass Destruction (WMD). Specifically, it will address how domestic politics in the US, Russia, and the expansion of NATO European States remain a serious obstacle. Moreover, if these domestic conditions continue to degrade, it could very well jeopardize the nuclear control regime in Russia, as well as increase Russia's reliance on TNWs for ensuring the country's security in the wake of NATO's continued expansion. Additionally, this section will highlight NATO's response to the dramatically changed European landscape and identify how it will implement the Alliance's New Strategic Concept and Counterproliferation policy to meet and deter the WMD threat along NATO's periphery.

After review of the threat environment, the monograph will then explore, develop, and evaluate creative steps/proposals and measures for consideration in the further reduction of TNWs in Europe. These steps/proposals fall into four general areas to include: formalization of the 1991 unilateral declarations; establishing a reduction and verification regime; alternative assurances through reconstitution and substitution; and deployment limitations and nuclear weapons free zones (NWFZs). We should use these findings as a vehicle to determine the viability or negligibility of existing deterrence policy and strategy.

The monograph concludes by reaffirming our need to retain a TNW warfighting capability as a prominent feature in the Alliance's New Strategic Concept to deter regional threats armed with NBC; however, alternative force options to include the withdrawal of remaining US TNW warheads warrant further consideration as NATO's nuclear strategy continues to evolve.

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I. Introduction

The dissolution of the Warsaw Pact and Soviet Union has removed the traditional Cold War logic and security rationale for the forward deployment of theater nuclear weapons (TNWs) in Europe. Moreover, with a reduction of almost 90 percent of US TNWs from NATO's soil, the debate continues on whether or not there still exists such a requirement, as well as making it more difficult for key decisionmakers to clearly articulate their future relevance. Additionally, budget and force restructuring cuts raises the question of whether a continuing TNW nuclear role is in fact still feasible. These factors, when coupled with the idea that traditional concepts of deterrence have been eroded in the wake of alternatives assurances and qualitative advances in conventional capabilities, suggest that careful investigation needs to be made to determine a further reduction, if not complete withdrawal of US TNWs in Europe.

Based on these conditions, the research question for this monograph is to determine what creative steps, proposals or measures would merit consideration and help jump-start dialogue between the US and Russia for deeper reductions in their TNW stockpiles, as well as to define the associated issues, obstacles and challenges. Both the US and Russia's histories are replete with successful arms control examples. So surely both sides can look to their past to find prescriptions of how to deal with the development of disarmament measures that can be undertaken to generate the needed debate necessary to lead to the institution of new arms control measures and agreements, as well as preserve a credible, effective deterrent in the face of growing challenges to maintaining a stable European security environment and strategic relationship in the years to come.

Chapter Two of this monograph will start by providing a historical review on the evolution of NATO's nuclear strategy, focusing almost exclusively on the conditions that warranted the introduction and employment of TNWs into Europe. Additionally, it will highlight some of the economic and national security influences that led to changes in NATO's nuclear strategy and the development of policies that carefully linked TNWs to US strategic nuclear weapons to reassure a US commitment to Europe, and provide decisionmakers greater flexibility through multiple options to respond to any aggression. It will

also describe the geopolitical landscape subsequent to announced 1991 and 1992, US and Russian arms reduction declarations. The US eliminations alone represented upwards to a 90 percent reduction in TNWs, eliminating the entire US world-wide inventory of ground-launched TNWs; the removal of all *nuclear* Tomahawk land-attack cruise missiles (TLAM/N) from surface ships and submarines, as well as nuclear bombs aboard aircraft carriers; the dismantlement and destruction of these warheads, and the securing of the remainder in central storage areas. Russia, for its part, pledged to eliminate all nuclear warheads on land-based tactical missiles, as well as nuclear artillery munitions and mines; to withdraw nuclear warheads from air defense systems and to store them at central bases; to remove all tactical weapons from surface ships, submarines, land-based naval aviation, and to secure those weapons not eliminated at central storage sites in Russia. Based on these reductions and the continued rapprochement between the US and Russia, the central question now is how much lower can we go in the reduction of TNWs.

Chapter Three will carefully examine NATO's threat environment and possible responses. Considerations will concentrate on two principal threats—Russia and the proliferation of Weapons of Mass Destruction (WMD).¹ Specifically, it will address how domestic politics in the US, Russia, and the expansion of NATO European States remain a serious obstacle. Moreover, if these domestic conditions continue to degrade, it could very well jeopardize the nuclear control regime in Russia, as well as increase Russia's reliance on TNWs for ensuring the country's security in the wake of NATO's continued expansion and conventional force inferiorities. Additionally, this Chapter will highlight NATO's response to the dramatically changed European landscape and identify how it will implement the Alliance's New Strategic Concept and Counterproliferation policy to meet and deter the WMD threat along NATO's periphery.

After having analyzed the threat, Chapter Four will explore, develop, and evaluate creative steps/proposals and/or measures for consideration in the further reduction of TNWs in Europe. These steps/proposals fall into four general areas to include: formalization of the 1991 unilateral declarations; establishing a reduction and verification regime; alternative assurances through reconstitution and substitution; and deployment limitations and nuclear weapons free zones (NWFZs). Bare in mind,

however, that it is impossible in this short monograph to examine thoroughly the obstacles which may prove problematic in implementing the proposals presented, or to fully elaborate all of the possible alternatives to overcome inherent difficulties. Nonetheless, we should use these findings as a vehicle to determine the viability or negligibility of existing deterrence policy and strategy. Understandably, for now and well into the future, the combination of advanced conventional precision-strike weaponry and TNWs still act as a defining influence in uncertain times. However, we no longer have the benefit of the current situation, as it is likely to change in the near future. Hence, the time to act is now, to increase the effort in negotiating the further reduction of TNWs!

Meanwhile, given the confusion that can arise over the technical distinctions between tactical and strategic levels of use involving nuclear weapons, the term theater nuclear weapon (TNW) or theater nuclear forces will be used during discussion on present and future employment of nuclear weapons on the tactical battlefield. In terms of a working definition, I will use the joint doctrine definition for the employment of TNW:

Tactical Nuclear Weapons Employment: The use of nuclear weapons by land, sea, or air forces against opposing forces, supporting installations or facilities, in support of operations which contribute to the accomplishment of a military mission of limited scope, or in support of the military commander's scheme of maneuver, usually limited to the area of military operations.²

The definition of TNWs has been the subject of debate since their arrival on the nuclear stage. Dating back to the late 1940s early 1950s, the term *tactical nuclear weapons* was originally used to distinguish battlefield nuclear operations from theater nuclear operations (planned and executed above Corps level), and from nuclear strategic warfare (delivery of nuclear warheads against the war-making potential of an enemy state).³ In another attempt to clarify the definition, Wolfgang Heisenberg noted,

A military action is usually called "tactical" if it is directed primarily against the military forces employed by the enemy, while a "strategic" action tries to destroy his military resources. Since most weapons can be used in both tactical and strategic functions, nuclear weapons cannot be defined by their technical qualities, like yield or range. Coincidentally, NATO preferred to use the phrase "tactical use of nuclear weapons" rather than "the use of tactical weapons." This refers to an employment of nuclear weapons in the context of direct defense or deliberate escalation, not not general nuclear response.⁴

Heisenberg's view on the inability to define nuclear weapons by their technical qualities, in this case yield and range, stems from the fact that corresponding yields ranged all the way from sub-kiloton to

megatons.⁵ Moreover, these yields spanned the range from conventional to strategic forces. In terms of range, Jeffrey Record's view in "US Nuclear Weapons in Europe" goes on to describe *tactical nuclear weapons* in three separate mission categories: *battlefield* or *short-range* theater nuclear weapons designed to influence the outcome of combat by destroying engaged enemy forces; *long-range* theater nuclear weapons designed to influence the movement of enemy forces and logistics to and from the combat zone or by destroying vital rear area installations; and *semistrategic* nuclear weapons that encompass all nuclear weapons designed by the US for theater use, but could reach... targets inside the Soviet Union from present locations...⁶ Meanwhile, Thomas Citron in his Handbook for Nuclear Weapons offers yet another definition for TNWs, referring to them as "those *theater* weapons, more precisely termed *short-range* and *battlefield* weapons, whose purpose is to affect directly the course of a tactical maneuver or a battle."⁷

A similar problem exists with the description of TNWs. Descriptions to date have gone the full spectrum to include: nuclear weapons on the tactical battlefield; battlefield nuclear weapons; nuclear fires on the battlefield; nuclear weapons of nonstrategic variety; low yield atomic weapons; tactical use of nuclear weapons; short-range theater nuclear weapons; substrategic nuclear weapons; conventional nuclear weapons; and simply--theater nuclear weapons.⁸ Therefore, in an attempt to clarify the technical distinctions and definition of TNWs in this monograph, the joint definition will apply. Let it not be forgotten; however, that while described as a TNW, these weapons still have strategic implications. Consequently, most changes that affect nuclear doctrine, strategy, and policy above the tactical level affect similar issues involving the employment of TNWs. As a result, the line between tactical and strategic has become more blurred and issues surrounding the employment of TNW can easily be viewed as strategic.

II. Evolution of NATO's Nuclear Strategy: 1950 to Present

Since its inception on 4 April 1949, the North Atlantic Treaty Organization (NATO) has witnessed a dramatic transformation of the geopolitical and strategic landscape, and changing security environment in Europe. Moreover, these changes have had a profound effect on NATO's nuclear weapons strategy and doctrine, one where the first-use of strategic nuclear weapons were considered an integral part of the deterrence equation during the Cold War, to one that leaves open the option of first-use of nuclear weapons; however, as a last resort. To date, there have been varied interpretations, perceptions, formulations, and strategic concepts both within and outside of NATO as to the role TNWs play in an Alliance strategy that is purely defensive in purpose. Early public debates centered on their utility as part of a massive retaliatory nuclear strike (as a means to deter a conventional attack on Europe), as a key component of the strategy of flexible response, tripwires, an essential element of an emerging deterrent posture, and if deterrence failed, providing a capability to respond in kind along the continuum of deterrence. In more recent discussions and deliberations, due to the dissolution of the Warsaw Pact, the end of the Cold War, the reunification of Germany, successful arms control negotiations and major force reductions, NATO expansion, and the absence of a monolithic threat, increased attention is now being placed on a reduced reliance on TNWs in Europe. Has the presence of TNWs outlived its utility in Europe? Do these weapons now exist only as a political tool due to their deterrent value? Under what conditions would TNWs be employed? Finally, during this time of decreased reliance, what numbers of warheads are essential for the defense of Europe and can the existing force structure possibly withstand yet another round of even deeper unilateral reductions or withdrawal from Europe?

Before we provide answers to these questions and delve into the arguments of critics who argue both for and against further reductions and/or the total withdrawal of US TNWs, this chapter will briefly revisit some of the external and internal influences on the initial deployment of nuclear weapons to Europe and the development of NATO's nuclear strategy from 1950 to present. Emphasis will be placed on events that have had an effect on how the US and Allied administrations and military institutions viewed the employment of TNWs during the Cold War and post-Cold War environment. In this context, most of the

discussion on the development of NATO's nuclear strategy will be played out against the backdrop of the Cold War.

International Developments affecting Change

International developments in the late 1940's and early 1950's strongly suggested that the Soviet Union was posturing itself into a position of greater global power. It was during this period the US and its Allies in Europe witnessed the Berlin crisis of 1948-49, the fall of China, the first Soviet detonation of an atomic bomb in 1949, followed by the detonation of a thermonuclear bomb in 1953, and the costly Korean War. For the Alliance, these events made the concept of containment painfully clear. Moreover, they served as a wake-up call and resulted in a review of both the US national strategy and the national security problem, and NATO's defense strategy. Particularly, the Alliance immediately recognized their inability to prevent a Soviet advance onto their territory. This observation led "US planners to conclude that the best option would be a strategic retreat, followed by a US led retaliation with Atomic weapons clearing the way for another Normandy type re-invasion of the continent."⁹ However, these plans were soon rejected, calling instead for a strengthened Alliance.¹⁰ This call led to a Ministerial meeting of the North Atlantic Council in Lisbon, Portugal in 1952. It was during this meeting that the Alliance concluded that they were unable, as well as unwilling to finance the costs required to field approximately 100 divisions and 9,000 aircraft for the defense of Europe. All things considered, the Allies opted for a total of 50 divisions with 4,000 aircraft, as well as a revamped naval force. However, even these Lisbon force goals for most of the Western Allies amounted to little more than wishful thinking, based on the austere economic and resource conditions being experienced by most of Europe.¹¹

1950s -- Massive Retaliation and Graduated Deterrence

Meanwhile in the US, the Eisenhower Administration began to craft a national security strategy and put the task to test in the form of a "New Look" at the US national security problem, which by October 1953, led to a new presidentially approved planning document (NSC 162/2) that increased the US reliance on the superiority of nuclear weapons and a strategy of massive retaliation, and forced the Allies to associate themselves with a nuclear strategy.¹² The strategy of massive retaliation was based on the ability

to target populations and key industrial centers--deemed countervalue targets--perceived to be of the greatest value to the Soviet Union.¹³ As for the role of conventional forces they would provide the "tripwire or shield."¹⁴ Once attacked, a nuclear "sword" would be released (triggering the employment of both strategic and theater nuclear weapons). Hence, the phrase "Sword and Shield" was adopted to describe NATO's defense policy.¹⁵ In terms of deterrence, it was based on the threat of an immediate and massive retaliation using simultaneous nuclear attacks on these countervalue targets--representing the systematic theory of deterrence in the Cold War era. Additionally, it recognized that the US placed their bets on a strategy that offered more bang for the buck. The US also instituted a new concept known as the "long haul," meaning the steady build up of defensive strength at a rate sufficient to preserve the economic strength of the US and our allies, and reinforced by the availability of new weapons with enhanced destructive power.¹⁶ An important part of this build-up dealt with NATO's acceptance of the forward deployment of US TNWs on its soil to deter a conventionally superior Soviet Force.

In political and economic terms, Eisenhower's administration saw TNWs as a cost effective means to provide defense for the United States and its Allies without resorting to the maintenance of a large standing force in Europe against a potential attack by an overwhelming Soviet conventional threat.

Jeffrey Record in NATO's Theater Nuclear Forces Modernization Program: The Real Issues notes, "budgetary rather than strategic considerations were in fact paramount in prompting the US decision to deploy TNWs in Europe; TNWs offered a cheap means of offsetting the conventional force imbalance in Europe, an imbalance that neither the US nor its NATO allies were politically or economically prepared to redress through requisite investment in costly conventional forces."¹⁷ Also, Eisenhower viewed the nuclear weapon as an integral part of defense and a weapon of first resort, based on the premise that future conventional wars could be deterred by the prospect of rapid escalation to crossing the nuclear threshold.¹⁸

In Europe, however, it was not until a classified study on the feasibility of shifting NATO's strategy to place primary focus on nuclear weapons, as did the *New Look*, was leaked to the press that the North Atlantic Council endorsed the *New Look* for NATO, thereby embracing the strategy of massive retaliation.¹⁹ The doctrine of massive retaliation was adopted by NATO in the fall of 1956 in the form of a Ministerial Committee Document 14/2, otherwise known as MC 14/2. Concurrent with NATO's evolving

strategic doctrine, NSC 162/2 reinforced by the policy of massive retaliation decision in 1954, helped launch the formulation of plans for the development and employment of dual-capable weapons systems, as well as the development of a major TNW program.²⁰ The first breakthrough of a tactical nuclear capability came by way of the development and production a limited number of atomic field artillery projectiles, developed for the 280mm cannon. However, the first operational deployment of a TNWs to Europe occurred with the Honest John in 1954.²¹ TNWs were developed for employment down to the battlefield level where artillery and even recoilless rifles within line-of-sight of opposing forces could use nuclear weapons.²² Atomic mines were produced to mine likely avenues of approach, and development began on miniaturized nuclear bombs for attack aircraft and light bombers, warheads for air-defense missiles, and a full range of nuclear capabilities at sea. In fact, the US positioned up to 700 TNWs in Europe by the end of 1954.

Although NATO adopted the US doctrine and accepted the deployment of nuclear weapons on their territory, perceptions began to change in the late 1950s, focusing primarily on the potential effects of the employment of TNWs. It became clear, based on the results of the Exercise “Carte Blanche” held in June 1955, that nuclear weapons could not be used just as if they were conventional weapons--in a precise and discriminating fashion. The Exercise indicated that a nuclear exchange over Europe could result in more than five million casualties.²³ The Europeans could not fathom the thought of so many casualties, particularly anything that could pale in comparison to the horrors of WWII.²⁴ As a result, the Allies preferred a strategy that achieved deterrence by the threat of immediate nuclear escalation between the two major superpowers.

The strategies that characterized the Truman and Eisenhower years were altered in the late 50s when the Soviet Union demonstrated an intercontinental ballistic capability. As a result, the concept of massive retaliation came under severe scrutiny. Most of the questions centered on whether or not threats under a strategy of massive retaliation were credible considering the increased Soviet strategic nuclear capability and the power of preemption, stemming initially from the unconfirmed bomber gap and subsequently from a perceived missile gap in favor of the Soviets. This perceived increase in Soviet force capability, led to a change in deterrence theory, which was now based on requirements calling for a second strike or

retaliatory strike capability to convince the aggressor that the costs will heavily outweigh the prospective gains. This issue was first raised by Albert Wohlstetter, when he suggested that a first strike could be deterred by maintaining a credible second strike.²⁵ Theoretically, this concept was based on the assumption that a preemptive attack can be absorbed and a retaliatory capability would survive to inflict unacceptable damage on the aggressor, amounting to a strategy of sufficiency. Another problem stemmed from the notion of declining credibility of nuclear weapon use in anything other than a general war. In response, the Eisenhower Administration deliberately sought to inject a degree of ambiguity by not declaring at what point massive retaliation might become a reality.²⁶ However, this rhetoric along with budgetary constraints suggested that any form of aggression on the part of the Soviet Union would be met with threats that increase the likelihood of nuclear strikes. Taking it a step further, the US now ran the risk of being seen as bluffing.

To mitigate these concerns, massive retaliation was supplemented with the strategy of *graduated deterrence*. Graduated deterrence stipulated that Soviet attacks across the *tripwire* would be forestalled by the early use of tactical vice strategic nuclear weapons in theater. However, this strategy too was met with criticism, claiming that the Soviets would also obtain a tactical nuclear capability and the threat of use could easily portend to a strategic strike. Moreover, the first use of TNWs could conceivably escalate into an all-out strategic war.

1960s -- Flexible Response and Deterrence through Ambiguity

In the late 50s to 1960, a consensus surfaced within the Defense establishment calling for a shift away from a solely nuclear battlefield to one with greater emphasis on fighting a battle with conventional forces. Primarily, the doctrine of massive retaliation was giving way to a doctrine of *limited nuclear war* in the inner circles of the Kennedy Administration. This doctrine was heavily influenced by Maxwell Taylor, who recognized that an all-or-nothing threat of nuclear retaliation lacked credibility in many potential regional or secondary scenarios.²⁷ President Kennedy initially, accepted this doctrine, however, over time he believed that the limited use of TNWs during conflict was unfounded. His reasoning was based on the contention that once the nuclear threshold was crossed it would only escalate into an

unlimited nuclear exchange. Despite these findings, the US continued to upgrade its TNWs stockpiles in Europe and their employment slowly joined existing deterrence theory. Hence, should deterrence fail, TNWs would be used to repel a conventional or nuclear attack by the Soviet Union. In a slightly different form, the doctrine of *limited nuclear war* became the genesis of the Kennedy-McNamara “flexible response” policies.

Not surprisingly, with the election of President Kennedy came the replacement of the *New Look* with the strategy of “Flexible Response,” a policy providing graduated response options to any foreseeable crisis as means to avoid escalation to general nuclear war. Meanwhile, massive retaliation, with its sprinkle of graduated deterrence was viewed as to rigid and was rejected by the Kennedy Administration in favor of a strategy of Flexible Response based on a scale of aggression in 1962. Additionally, the strategy of Flexible Response was adopted as a means to respond in either a conventional or nuclear manner. Specifically, the added flexibility was intended to enhance the credibility to our nuclear deterrent and imply that conflict in Europe could be initiated as a limited war versus a strategic nuclear exchange between the Soviet Union and the United States, as well as enhance the targeting options made available to the President. Moreover, this strategy coupled the US strategic arsenal to land war in Europe (transatlantic link) so that the Soviets could not avoid the risk of all-out war, should it contemplate local aggression.²⁸ Along these same lines, the Administration moved to strengthen conventional forces and provide an improved capability to respond across the spectrum of conflict.

Meanwhile, the US felt that NATO too should pursue a similar approach and by so doing, posture itself to deter a theater nuclear attack, as well as limit non-nuclear operations of the Warsaw Pact and Soviet Union. However, a question that plagued the Alliance’s policy making and immediate acceptance was one of sharing not only control over nuclear weapons, but their possession. Two proposals for a solution were introduced, one calling for the creation of a multilateral nuclear force (MLF), and the other centered on allowing the possession of nuclear weapons by NATO countries. The MLF called for the formation of a NATO assigned fleet of 25 surface combatants resembling merchant vessels that would be manned by mixed NATO crews.²⁹ Additionally, it was to give the Alliance a role in nuclear decisionmaking. However, the US was reluctant to allow for the spread of nuclear technology,

technology which could easily fall into the hands of members outside the Alliance. Moreover, the thought of a Germany assuming control over nuclear weapons was a political nightmare, as well as France's desire to obtain its own nuclear capability, coupled with its military and political leadership aspiration within the Alliance. As a result of these political sensitivities and the inability to effectively manage and control the MLF, it failed.³⁰

The second proposal was to allow the possession of nuclear weapons by NATO Alliance members. The main desire here on the part of the NATO Alliance, was to have greater influence on US policies governing the development and implementation of NATO's nuclear strategy. According to Buteux in The Politics of Nuclear Consultation in NATO -- 1965 to 1980, three aspects to this desire to influence the US were: wanting access to the process by which Alliance strategy interrelates with US nuclear strategy; wanting the opportunity to advise and counteract US decisions which members of the Alliance questioned; and exercising influence on US strategic decisions themselves.³¹ In an attempt to ameliorate any differences, several committees and groups were founded to include the Nuclear Planning working Group (McNamara Committee), the Nuclear Defense Affairs Committee (NDAC), the Nuclear Planning Group (NPG). McNamara's Committee was the vehicle for the US to share sensitive information relating to intelligence, planning, and resource management of nuclear weapons with Alliance members. The committee eventually was divided into the NDAC and NPG. The NPG was to afford non-nuclear Allies a consultative role in decisions of the employment of nuclear weapons and charged with the responsibility of developing political guidance for the use of TNWs in support of the strategy of Flexible Response. A key document produced by the NPG to resolve diverging perceptions between the Allies and the US was entitled the Provisional Political Guidelines. This document provided guidance on initial use of TNWs by NATO and the basis for NATO nuclear warfighting authority in the face of Soviet aggression.³² In consideration of these recommendations and the fact that the doctrine of massive retaliation was not conducive to lower levels of threat or aggression, NATO went on to adopt the strategy of flexible response as MC 14/3 in 1967. As a result, TNWs became an integral part of NATO defense plans, deployments and training. Moreover, the once nuclear only deterrence strategy, now allowed for a variety of employment options for defense and retaliation ranging from conventional to strategic nuclear forces.³³

To implement this strategy, NATO would use each component of the triad--conventional, theater nuclear, and strategic nuclear forces. In fact, Chancellor Schmidt called flexible response a strategy of both deterrence and defense, based on the combination of these three variables starting first with strategic forces, second with TNWs, and third, conventional military forces. Specifically, conventional forces would deter and defend against a conventional attack, theater nuclear forces would deter a conventional and theater nuclear attack, as well as limited conflict escalation, and strategic forces would pose as the ultimate deterrent by reinforcing conventional and theater nuclear forces by the threat of assured destruction. Additionally, to ensure the threat to employ TNWs was viewed by the Soviets as credible, the US and its allies consistently demonstrated their will to use them via security agreements, employment doctrine, operational plans, and through the show of overwhelming support for nuclear deterrent strategies.

1970s through 1980s -- Reevaluation of Flexible Response and Modernization

The interim years from the mid 70s to the 90s saw noticeable improvement and resurgence in conventional forces to match improvements in TNWs. In part, this effort was spurred on by the Soviet Union reaching parity in numbers of strategic weapons and greater numbers in theater nuclear forces which reinvigorated nuclear deterrence in the 70s. Meanwhile, Flexible Response continued to serve as the basis for US foreign defense planning and policy, along with a series of arms control measures aimed at reducing tensions between the Soviet Union and US.³⁴

Like Kennedy, Nixon too wanted to make changes to the Administration's nuclear policies. Nixon's Administration identified three problem areas requiring change. First, the extended deterrence policy for Europe lacked credibility. Second, US response options were nonexistent below major counterforce attacks. Third, the Soviets surpassed the US in offensive nuclear strike capability and were in the early stages of fielding an anti-ballistic missile complex. On 17 Jan 1974, Nixon signed the National Security Decision Memorandum (NSDM)-242 (know as the Schlesinger doctrine). This new Presidential directive sought to remedy the aforementioned problems by "providing a more credible deterrent and escalation control through the development of a wider array of planned limited nuclear options."³⁵ Additionally, the

new directive “provided the option of limiting strikes down to a few weapons.”³⁶ Specifically, it directed the development of limited employment options, target withholds that could be used for intra-war deterrence, and the ability to control the timing and pace of an attack execution, in order to provide the aggressor opportunities to consider his actions.³⁷ Nixon’s approach lent greater credibility to NATO’s threat of nuclear first-use in the event of failure against an overwhelming conventional Soviet attack. As for planning, it provided for escalation control by directing that plans be drawn to allow the NCA the ability to execute. Overall, the US focus was on responding to a massive Soviet strategic force expansion without incurring the associated cost to support a corresponding arms race, while maintaining a nuclear security umbrella for our allies.³⁸

Mutual Assured Destruction. To mitigate Nixon’s concerns, the solution was an updated Flexible Response strategy that became known as Mutual Assured Destruction (MAD).³⁹ MAD was defined as a reciprocal capability between peer threats to inflict unacceptable damage on each other during a nuclear exchange--damage of such magnitude that it could threaten all human society.⁴⁰ Additionally, the ability to destroy an enemy’s nuclear forces after an initial strike was seen as the most effective way of limiting damage should deterrence fail. This ability also came with the requirement for a more flexible, survivable, reliable, and highly accurate nuclear force to assure a decrease in the risk of nuclear war.

During the Ford Administration, the US and its NATO Alliance members witnessed a continued strategic and conventional force build-up in the Soviet Union in the face of decreasing military budgets. Although Ford’s administration followed a strategy of flexible response, it sought an ability to respond accordingly to the ever growing Soviet threat--an ability to become known as selective targeting response options (options between inaction to a massive response).⁴¹ These options were outlined in Secretary of Defense Schlesinger’s 1975 annual report, stating “rather than massive options, we now want to provide the President with a wider set of much more selective targeting options--emphasizing preplanned, limited nuclear options, secure reserve forces, escalation control, and targeting to impede Soviet postwar recovery.”⁴² However, due to budgetary constraints, the US could not meet the force requirements necessary to implement this strategy, while Soviet forces continued to expand. From 1976 to 1977, two reports--the Military Implications Team (MIT) and the Political Implications Team (PIT)--set about the

study of the implications and possibilities of emerging conventional and nuclear technologies.⁴³ The objective of these reports was to identify critical technologies that would give the advantage to NATO over the Warsaw Pact. Moreover, “they were to become the basis for future defense planning.”⁴⁴ In October 1977, the High Level Group (HLG) was established to examine TNW modernization requirements and determine the military-political, and fiscal implications. In 1978, NATO agreed to a long-term Defense Plan which called for the modernization of conventional and nuclear weapons to include a mix of the Pershing II, the ground-launched cruise missile (GLCM), and the sea-launched cruise missile (SLCM). In all, based on the recommendations of the NPG, the deployment of 572 nuclear weapons to 5 NATO countries was approved.⁴⁵ However, the austere budget environment during this timeframe precluded a significant modernization effort due to a shift in focus on securing oil resources in the Middle East and finding ways to lessen the financial burden of the defense of Europe to be borne by each of the Allies.⁴⁶ Other issues centered on tactical nuclear doctrine--deterrence or warfighting; the “neutron bomb” debacle which caused the Alliance to essentially lose faith in the US ability to effectively use the decisionmaking process and its implications on the future of European security; and long-range theater nuclear force modernization meant to eliminate force disparities that could place NATO’s security at risk and put into question the continuing credibility of the US nuclear guarantee to Europe.

The years between the Ford and Bush Administrations saw most of the battles concerning nuclear weapons being waged at the strategic level and an increase in arms control negotiations. From 1981 to 1982, the US was prepared to cancel deployments of the Pershing II and GLCM if the Soviet’s reciprocated with the dismantlement of their SS-20, SS-4, and SS-5 missiles, as well as making preparations for Strategic Arms Reductions Talks (START). In 1987, with the ratification of the Intermediate-Range Nuclear Forces Treaty (INF), the US started to experience a significant, but welcome decrease in nuclear weapons. A decrease that required a reexamination of existing deterrence theory and provided yet another opportunity to look at further reductions to the existing nuclear arsenal in Europe.

1990s -- Reduced Reliance on TNWs and Unilateral Arms Reductions

The two most dramatic events that occurred during the 1990s were the replacement of the strategy of Flexible Response with the “Alliance’s New Strategic Concept” and unilateral calls for significant arms reductions in TNWs. On Nov 8th and 9th, 1991, the NATO Alliance effectively replaced the strategy of Flexible Response of 1967 with the New Strategic Concept. Although this concept reaffirmed the enduring value of NATO’s nuclear force posture, the role of nuclear weapons were de-emphasized and changed to “weapons of last resort.” The Alliance Strategic concept of 1991 states:

The fundamental purpose of the nuclear forces of the Allies is political: to preserve peace and prevent coercion and any kind of war. They will continue to fulfill an essential role by ensuring uncertainty in the mind of the aggressor about the nature of the Allies’ response to military aggression. They demonstrate that aggression of any kind is not a rational option. the supreme guarantee of the security of the Allies is provided by the strategic nuclear forces of the Alliance, particularly those of the US; independent nuclear forces of the UK and France, which have a deterrent role of their own, contribute to the overall deterrence and security of the Allies.⁴⁷

Also, in consideration of the radical changes in the security situation, the Strategic Concept specified “the circumstance in which any use of nuclear weapons might have been contemplated... are therefore even more remote. Hence, they can significantly reduce their sub-strategic nuclear forces, while at the same time maintain adequate sub-strategic forces based in Europe which will provide an essential link with strategic nuclear forces” of the US.⁴⁸ These forces will “consist solely of dual capable aircraft (DCA), which could if necessary be supplemented by offshore systems.”⁴⁹

On 27 Sep 1991, President Bush unilaterally called for the elimination of all land-based TNWs and removal of all tactical nuclear warheads from surface and sub-surface combatants.⁵⁰ Most notably, the elimination of all ground-launched weapons effectively created a nuclear-free Army for the first time since their inception into the service. NATO too, decided to reduce its inventory of TNWs, reducing the number of air-delivered TNWs deployed to Western Europe from 1,400 to approximately 400. Specifically, these reductions resulted in the destruction of more than 3,000 TNWs and the withdrawal of another 1,275.⁵¹ Additionally, TNWs remaining in theater were now limited to DCA, unless the US decided to rearm its fast attack submarines with TLAM/Ns.

On 5 October 1991, Moscow, with a substantially larger inventory of TNWs, approximately 17,000 to 18,000 weapons (including 4,000 redeployed from Eastern Europe and 6,000 from former Republics), pledged to make similar reductions, as well as making deeper cuts to her strategic forces.⁵² In response to yet another round of Bush initiatives in January 1992 (although they focused primarily on strategic nuclear weapons), Yeltsin announced the intent of eliminating all sea-based cruise missiles. Reductions continued well into the mid-90s as evidenced in the recommendations of the 1994 Nuclear Posture Review. According to this review, the Navy was directed to abandon the capability of employing nuclear weapons on its surface fleet. What this amounted to was that the US now “pledged to eliminate the option of deploying TNWs on carrier-based aircraft and of carrying nuclear cruise missiles on surface ships, but retained the option of deploying nuclear cruise missiles on submarine.”⁵³ When coupled with the preceding reductions, the US has unilaterally reduced its tactical nuclear arsenal by some 90 percent.⁵⁴ Other reductions outside the US involved the French and the UK, where France eliminated its 18 S3-D intermediate-range ballistic missiles and the UK announced the impending elimination of its air-delivered gravity bombs carried on DCA.⁵⁵ Noteworthy of consideration is the fact that these pledged reductions are neither verifiable nor irreversible, and not bound by any formal or legally binding treaty.

In sum, this Chapter has examined the evolving strategy for the employment of TNWs in Europe over the last four decades. Based on an historical review, it becomes obviously clear that the objective of nuclear forces in Europe has been to deter an overwhelming Soviet conventional attack on the Alliance. Additionally, we identified the conditions that led to NATO’s adoption of the doctrine of massive retaliation, how it lost its credibility in the face of an increased strategic and theater nuclear forces capability by the Soviet Union, and eventually gave way to a strategy of Flexible Response. Coinciding with these changes, the emphasis on strategic nuclear forces shifted to one that entails a combination of strategic and tactical nuclear weapons, and conventional forces. As a result, it provided the NATO Alliance with a greater latitude of action when responding to a wide variety of threats. Equally important during this period were the political and military influences that dramatically affected the role of TNWs. Based on these conditions, are TNWs still relevant? Do they still possess a warfighting ability or are they merely seen as a political tool to bolster one’s prestige and influence? Does the US still require the

forward deployment of TNWs in Europe, if so, why? With the risk of conventional war almost non-existent, and the continuing warming of relations between the US and Russia, how much lower can both sides go in reducing their TNWs inventories? In order to truly determine the relevance of TNWs and potential conditions that could translate to further reductions of TNWs in Europe, if not total withdrawal, we must first analyze existing and emerging threats to European security which will be discussed in the following Chapter.

III. NATO: Threats and Response

Prior to the end of the Cold War, the monolithic Soviet threat consisting of its strategic, theater, and conventional forces was very real. With the dissolution of the Warsaw Pact and the Soviet Union; however, “the threat of a simultaneous, full-scale attack on all of NATO’s European fronts has effectively been removed and thus no longer the focus for Allied strategy.”⁵⁶ Nonetheless, “at a time when NATO has vastly reduced its nuclear forces, Russia still retains a large number of TNWs of all types.”⁵⁷ Hence, when coupled with the possible emergence of a revanchist Russia, Russia is still perceived as a potential strategic concern within the Alliance as it postures itself to adapt to an evolving security environment. Also looming on the horizon are new security challenges and growing nuclear, biological, and chemical (NBC) proliferation risks to NATO’s periphery.⁵⁸ As a result, NATO will have to reexamine how nuclear weapons factor into its security strategy against a growing WMD threat. Moreover, where confrontation between the Soviet Union and the US worked well during the Cold War where the leadership has been rational in its thinking, potential NBC threats to US and its Allies’ vital interests abroad may now come from countries led by irrational actors, many of whom may not share traditional values as those held by the US and Russia. Given this political and deterrent context, this Chapter will examine some of the implications of Russia’s remaining nuclear capability and its impact on the future strategic balance in Europe, as well as emerging NATO policy considerations that are likely to include the option of using TNWs as part of a future force mix to deter regional NBC threats.

Russia’s still on the Scope

Although tensions between the US and Russia have warmed, Russia with its large nuclear arsenal and the potential for a reversal in democratic reforms are seen as a major security concern by the Alliance. As spelled out under the security challenges of the Alliance’s New Strategic Concept, “the Russian military capability and build-up potential, including its nuclear dimension, still constitutes the most significant factor the Alliance has to take into account in maintaining the strategic balance in Europe.”⁵⁹ Overall, the NATO Alliance members believe that the stability in Russia is tenuous, compounded by a

military establishment that has observed its fall from prominence in the midst of its country's struggle to form a credible democratic society. Evidence of this was revealed in Russia's disastrous foray into Chechnya. One result of Russia's conventional inferiorities, has been to adopt a doctrine similar to NATO's past doctrine of Flexible Response, whereby renewed emphasis is being placed in the reliance on TNWs.⁶⁰ Pavel Felgengauer argues, "as a nuclear power Russia will have to increasingly rely on its nuclear potential as its conventional forces degrade further. The war in Chechnya has amply demonstrated the Russian Armed forces' vulnerability. If they suffer another defeat in a local conflict... the political cost might prove totally unacceptable... so much that it might come up with a direct threat to employ nuclear weapons or even resort to a demonstrative nuclear strike in order to achieve victory in a hopeless war...⁶¹

Most analysts agree that Russia will continue to rely on the nuclear guarantee to maintain its national security, its survival, as well as world status. Moreover, nuclear weapons are seen as a means to "avoid irrevocable marginalization in the world community."⁶² Understandably, nuclear weapons "convey a much stronger 'hands-off' message than conventional weapons."⁶³ In terms of TNWs, Lambert and Miller, suggest there are "substantial concerns regarding Russian TNWs, in particular relating to their security and control mechanisms."⁶⁴ Reportedly, their study of Russia's nuclear arsenal suggests that "the potential for either deliberately planned or an unauthorized 'rogue' Russian nuclear weapons release is a serious concern for NATO."⁶⁵ William Potter, in Next Steps in Nuclear Disarmament: The Challenge of TNWs, indicates that the danger from TNWs not only stems from their destructiveness and unauthorized release, but primarily from their... vulnerability to theft.⁶⁶ This assertion is principally based on the characteristics of TNWs which are relatively small in size, widely dispersed, and dependent on their generation, do not possess effective electronic locks or Permissive Action Links (PALS) to prevent their unauthorized use.⁶⁷ Potter suggests that the aforementioned risks stem from the forward basing of TNWs and the procedural tendency to decentralize launch authority to the level of field commanders in a time of crisis as a method to prevent the disruption of critical communications between central political and military authorities.⁶⁸ A partial solution to this problem was the unilateral arms reduction declarations by Presidents Bush and Gorbachev in 1991. These declarations set into motion a means by which vast stores

of TNWs would be recalled, withdrawn, and most importantly--dismantled and destroyed. Unfortunately, as Potter observed, "the security of TNWs in Russia today is compromised by the lack of adequate storage facilities to handle the influx of warheads and by the continuing turmoil, economic hardship, political uncertainty, and general malaise within the armed forces."⁶⁹

Russian TNWs: Issues Warranting Concern. Some of the most pressing issues with Russia's TNWs center on what Lambert and Miller have described as "the threat of operational use, loss of control, or leakage of TNWs. These issues can be further subdivided in to five general areas:

- Physical and technical security
- The doctrine of pre-delegation
- Nuclear dependency in the face of certain military contingencies
- Stockpile consolidation and stewardship efforts
- Personnel and internal security problems⁷⁰

For the sake of brevity, only a few of these areas will be discussed.

Physical and Technical Security. In terms of physical and technical security, several organizations are held responsible for safeguarding nuclear weapons during operational deployment, withdrawal from service or scheduled maintenance, and weapons dismantlement or refurbishment. The units associated with these operations are special units of the General Staff, along with units of the armed forces--principally those responsible for their use; the Twelfth Main Directorate of the Ministry of Defense (Main Administration of Nuclear Weapons), known as the 12th GUMO; and MINITOM (the Russian agency created in 1992 to parallel the US Department of Energy), respectively.⁷¹ As for the physical infrastructure protecting these weapons, most were designed to inhibit an attack by NATO special forces. As a result of this view, nuclear weapons associated installations concentrated almost all of its security on physical barriers vice internal protection mechanisms. Hence, given the current geostrategic situation in Europe, there is now presumed to be a greater internal threat to stored nuclear weapons. According to the CIA, "... accounting procedures are so inadequate that an officer with access could remove a warhead, replace it with a readily available training dummy, and authorities might not discover the switch for as long as six months."⁷² In terms of technical security, the main issue here deals with Russian technical safeguards on TNWs. Most experts on Russian locking mechanisms indicate that the biggest problem rests with gravity bombs and cruise missiles. Reportedly, "locks on gravity bombs are not sophisticated

and cruise missiles lack adequate protection to inhibit unauthorized use.”⁷³ These conditions are mostly due to the Russians reliance on antiquated security methods, which if left unchecked could portend to a major security incident. To preclude the unauthorized use of a nuclear weapon from occurring in the US, the US in the 1994 NPR mandated that all nuclear weapons have PALs installed by 1996, thereby ensuring that the weapon would either disable itself or simply not function at all. According to Steven Zaloga, approximately 45 to 65 percent of Russian nuclear systems are equipped with PALs; however, most TNWs lack this security feature.⁷⁴ Based on these lacking safeguard measures, the potential for a major national security incident involving TNWs in the near future remains a major concern of the international community.

Nuclear Dependency in the Face of Conventional Contingencies. The main issue here is over Russia’s increasing reliance on nuclear weapons in the face of evolving conventional inferiorities and NATO expansion. This point is clearly articulated by Bruce Blair in Russian Realities and the Illusion of Arms Control that “the demise of the Red Army that formerly protected Russia shifted the burden of security to nuclear forces. Russia’s new military doctrine abandons its former pledge of no-first use of nuclear arms, and widens the conditions under which it might use them. By increasing its reliance on these weapons, Russia also magnifies the significance of its nuclear strategy.”⁷⁵ The majority of this newfound emphasis has been placed on the value and role of TNWs--historically viewed by Russians as warfighting weapons. In fact, as one of the many responses to NATO’s expansion, some Russian officials have hinted at considering the redeployment of TNWs as front-line weapons. Essentially, the prospect of NATO deploying nuclear weapons on Russia’s front door is seen as extremely provocative. On several occasions warnings have suggested “that in the face of mounting unfavorable balance in the correlation of forces, Russia might resolve to re-evaluate the 1991 unilateral TNWs initiatives, as well as the geopolitical situation warranting the retention and redeployment of their TNWs, and abrogate other existing arms control treaties. The likelihood of a redeployment of TNWs in Belarus, as well as back on ships at sea and tactical aircraft is very high. Additionally, Russia believes that when faced with an economic crisis and a rather modest ability to equip its army and navy, for the foreseeable future it will be forced to rely on nuclear weapons to ensure its security.”⁷⁶ This rhetoric, when coupled with Russia’s

evolving conventional force structure clearly portends to a much more aggressive force structure and "would have the unfortunate proliferation effect of degrading command and control over those weapons most vulnerable to unauthorized use, theft, and accident."⁷⁷ As John Deutch points out, "... if anything goes wrong in Russia, it is likely that it is in the nuclear force area that we will face the first challenge."⁷⁸

Stockpile Consolidation and Stewardship Efforts. One of the biggest concerns since the declaration of the unilateral arms reduction initiatives has been the security of Russia's nuclear weapons stockpile. A summary of foreseeable dangers in this area follows to include: the loss of weapons-storage facilities and withdrawal of weapons from front-line units in non-Russian republics; the compromise of weapons security during transfer en masse to central storage facilities, dismantlement, and refurbishment plants; the security of stored dismantled nuclear components, as well as those which are recycled back into the active stockpile.⁷⁹ Even more disturbing is that the Russians are not bound by any international treaty to declare the quantities and locations of its nuclear weapons grade material. In sum, these issues place an additional burden on the system of nuclear safeguards in Russia--ones that will continue to occupy both the US and NATO Alliance members for years to come.

Personnel and Internal Security Problems. The last area deserving attention deals with a potentially explosive problem if left unchecked--a disgruntled military arm and a divided society. Present conditions are exacerbated by hardships being experienced by the military, the rise of crime, and widespread corruption, all of which increase the risk of an insider threat to Russia's security of nuclear materials and systems. Possibilities could easily include the removal of nuclear material at associated facilities, collusion of high-ranking officials with unsanctioned access, and subterfuge or theft. This was not the case during the Cold War, when a rigid internal security regime (KGB) seemed to keep the country in check. Meanwhile, public statements from Russian officials continue to deny any and all accounts of breakdowns within their security for TNWs. To the contrary, John Lepingwell's Is START Stalling?, provides details on several alarming nuclear incidents. These incidents ranged from the discovery of a deserted firing battery of SS-25 mobile missiles, where the soldiers reportedly abandoned the weapons system to salvage for food; the shooting deaths of two soldiers at an ICBM base; and the death of three people aboard a torpedo boat during an attempted seizure.⁸⁰ Two other incidents in the recent past dealt

with the nuclear suitcase. In September of 1997, retired General Alexander Lebed, former Chief of Russian Security, claimed approximately 100 portable Special Atomic Demolition Munitions (1 Kiloton nuclear suitcase-size bombs) could not be accounted for. Although Lebed's claims were dismissed by Russian Defense officials it continues to raise concerns about the accountability of Russia's nuclear weapons.⁸¹ The other suitcase incident occurred on 25 Jan 1995, when it was reported that the Russians activated the "nuclear suitcase"--the electronic devise by which President Yeltsin could have given the go-ahead to launch several thousand nuclear missiles on an irreversible course over the Arctic and toward North America.⁸²

As a result of these incidents, one can only assume that if conditions continue to degrade inside Russia, an incident involving nuclear weapons may soon place the stability and security of Europe in jeopardy. In view of these concerns, it is readily apparent that the opportunity for a security failure in Russian nuclear weapons complex is much higher than in the past, as well as a Russian Federation now faced with a monumental task to develop a sound nuclear weapons control and accountability system.⁸³ Notwithstanding these concerns and internal difficulties, Russia remains convinced that its security rests with nuclear weapons that provide an enduring political deterrent value and warfighting capability.

Emerging Threat Environment- Proliferation of Weapons of Mass Destruction

Over the next 10-15 years, not only could the new geopolitical and military landscape be characterized by volatility, uncertainty, ambiguity and insurmountable complexity, but an estimated 25 countries may well have nuclear weapons.⁸⁴ Of particular concern to Southern Flank NATO members are nations such as Iraq, Iran, Libya, and Syria who will either possess or acquire a nuclear capability in the near term. Additionally, geography suggests that most of the future threats from NBC and ballistic missile delivery systems will be directed against US and Allied forces abroad before they are directed against their respective territories. Based on these possibilities, a major concern for the US and the Alliance is that a regional power involved in a local conflict might be able to prevent their entry into theater by using nuclear weapons against ports and airfields required to introduce forces.⁸⁵ Other possibilities include the chance that some transnational terrorist group, criminal syndicate, religious

sects, zealot, or other non-nation states acquire a nuclear weapon and employs it as an instrument of terror or blackmail. Similarly, some rebel elements within nuclear or emerging nuclear states may wrest control of nuclear weapons and use them to achieve personal political goals or possibly exact concessions from other neighboring countries.⁸⁶ Gregory Schulte, Chairman of the NPG staff Group offers yet another characterization on the inherently difficult nature of the proliferation threat by stating, "once in possession of such weapons... a rogue government may also perceive them as military weapons whose use, even on a limited scale, might help compensate for NATO's superiority in conventional forces and technology."⁸⁷

In few places are the aforementioned probabilities more likely to occur than the Middle East. The Middle East continues to be the most volatile region (malignated by political instability and conflict for years) and is prime for the proliferation of NBC. Iran, Iraq, Israel, and Libya, are just a few of the countries assessed to be aggressively pursuing NBC and ballistic missile delivery capabilities, constituting the primary threats to regional stability.⁸⁸ One intuitively obvious and forceful argument is that NBC proliferation will keep some form of nuclear deterrence at center stage in the process of redefining both a US national security strategy and Alliance strategic concept.

NATO's Counterproliferation Policy

We attach the utmost importance to preventing the proliferation of WMD, and where this has occurred, to reversing it through diplomatic means... [However,] as a defensive alliance, NATO is addressing the range of capabilities needed to discourage WMD proliferation and use. It must also be prepared, if necessary, to counter this risk and thereby protect NATO's populations, territory, and forces.⁸⁹

As mentioned above, the proliferation of WMD is a clear and well recognized threat to the US and its Allies. A threat, according to Jeffrey Larson, "that will be exacerbated in future conflicts where it is unlikely the US will fight alone."⁹⁰ Larson points out that a key element in building and maintaining coalitions in the future is to develop a common approach to countering the proliferation of WMD.⁹¹ Such is the case with the US working with NATO in formulating an adequate response to any WMD threat. Reportedly, with US prodding, NATO has become increasingly aware of the growing WMD threat to its security and vital interests.⁹²

In 1991, NATO leaders at the Rome Summit adopted the New Alliance's Strategic Concept. This Strategic Concept outlined responses to the risks posed by the proliferation of WMD. Specifically, it clearly recognized, "proliferation of nuclear, biological and chemical weapons and their delivery means continues to be a matter of serious concern."⁹³ This concern was met with a similar conviction in the United Nations and the US, where in 1992 and 1993 respectively, each stated that the proliferation of WMD constituted a threat to international peace and security, as well as becoming the most urgent arms control issue in the 1990s.⁹⁴ Warren Christopher, former Secretary of State, went so far as to tell his European counterparts that... "strong and collective action by the US and Europe is required to deal with the proliferation of WMD, missiles for their delivery, and sophisticated conventional arms and dual-use technologies."⁹⁵ This call for action was soon followed by a US proposal in late 1993 on a Counterproliferation initiative.

During 1994, the Atlantic Alliance made progress in expanding and intensifying its political and defense efforts against proliferation of WMD as an integral part of NATO's adaptation to the new security environment. By June of that year, NATO's new policy framework on the threat of WMD proliferation stressed that a response "must include both political and military measures to discourage WMD proliferation and use, and if necessary, to protect NATO territory, populations, and forces."⁹⁶ NATO felt that "robust military capabilities will signal to proliferants the utmost seriousness in which it approaches these risks."⁹⁷ Although the issue of how nuclear weapons fit into the Alliance counterproliferation calculus has not been fully addressed, NATO has indicated that "no one capability alone will suffice."⁹⁸ Specifically, "complementing nuclear forces with an appropriate mix of conventional response capabilities and passive and active defense, as well as effective intelligence and surveillance means, will reinforce the Alliance's overall deterrence posture against the threats posed by proliferation. Such a mix of capabilities will provide a firm basis for deterring or protecting the risks from proliferation, and will also contribute significantly to the Alliance's primary aim of preventing proliferation."⁹⁹ Essentially what this deterrence posture translates into is a strategy of deterrence through denial vice the traditional deterrence of the past which was based largely on the strategy of retaliation and punishment. According to some analysts, "the threat of a nuclear response to deter WMD use against NATO forces will simply not be credible in all

cases.”¹⁰⁰ Moreover, “while NATO’s military posture has not completely dismissed nuclear deterrence vis-à-vis potential proliferents, it does recognize that new proliferators may not be susceptible to the deterrence policies developed during the Cold War.”¹⁰¹

Deterring the Regional Threat: Rationality vs. Irrationality

Based on the WMD threat assessment, we may witness intense regional instabilities due to interstate rivalries and the rise in the proliferation of NBC technologies. Additionally, it introduces the prospect of the US and its Allies having to face an irrational regional actor, sometimes called madmen or fanatical, in future conflict.¹⁰² Although it seems self-evident that it would be potentially suicidal for a regional actor to launch an NBC attack on the military forces of a superpower or a collective defense entity, the historical record offers enough examples of seemingly irrational acts to suggest that this scenario should not be totally discounted.¹⁰³ Moreover, should a situation like this arise, it could severely complicate the application of deterrence theory and lessen the nuclear deterrent threat credibility. Given this possibility, it is necessary to examine the notion of rationality versus irrationality, and what it might take to deter the future regional threat.

Once the defender has determined if the aggressor can be relied on to be rational, he can then establish a desired goal of how deterrence will be applied against the given situation. The aggressor’s rationality or lack thereof will have a significant affect on the strategy employed and helps establish the various response options if deterrence fails. Two goals for consideration are one that prevents the use of NBC and another that focuses on the situation if the WMD threshold is crossed. In support of these goals, the strategies of denial and punishment (retaliation) are probably the best suited for the given situations. Through their use, regional aggressors can be threatened with, or suffer unacceptable damage by a US response that ensures the costs of their threat to use, or use of WMD against the US and its allies will heavily outweigh the prospective gains.¹⁰⁴ We are reminded, however, that successful deterrence throughout the course of these threats or actions hinges on the defender’s ability to clearly and concisely communicate the threat, understand the risk-prone strategic personalities of regional adversaries and the asymmetric nature of regional contingency where US and the Alliance’s survival is not at risk but the

adversary sees its own at stake, properly identify what the aggressor values most, and make the threat credible.¹⁰⁵ Otherwise, the prospects for traditional deterrence succeeding--that is deterrence based on denial and punishment--are problematic and in fact are more likely to fail."¹⁰⁶

In a broader sense, how the US and its Allies can best deter a WMD threat will likely differ by region. This being the case, it will be critical for the US and the Alliance defensive establishment to get inside the aggressor's ooda-loop--understanding the military, political, and cultural dynamics, as well as the things the aggressor values the most so that they can be held at risk for deterrent purposes. Additionally, until the US and its Allies develop a successful defense against the threat of, or use of WMD, regional actors may maintain a strong military/political incentive to acquire, threaten, and perhaps to use them.¹⁰⁷ Furthermore, so long as the desire to acquire NBC weapons exists, there will also remain powerful economic incentives to possess them. Regional actors who want to deter the US or the Alliance may reason that until they possess a capable defense against a WMD threat, both the US and the Alliance can be pressed to choose between preemptive strike, an overwhelming conventional attack, withdrawal, and the threat of nuclear retaliation. All of these are indeed very complex choices and as a result should warrant a continuous reexamination of current deterrence strategy. Overall, TNWs have been an essential element of the deterrence equation in providing the US and its Allies a multiple option capability throughout the Cold War. As we look into the future, TNWs can be expected to maintain a similar role in support of contingency operations against NBC-capable irrational actors. Bottomline, NATO clearly sees a role for its nuclear forces in deterring the threat of WMD proliferation.

Responses to Threatened Use, or Use of WMD on NATO's Periphery

Given a future threat environment where the stakes are high enough and alternative conventional deterrence options are inadequate, there are probably four kinds of situations in which the US or its Allies might respond with TNWs to the threatened use, or use of WMD on NATO's periphery:

- To deny, punish and respond to a NBC attack on either US forces deployed abroad, Allies, or vital US national interests.

- To halt a massive attack or an invasion against an Ally or in a region of US interest where US forces are at risk.

- To prevent a NBC attack on US or NATO, if possible
- To respond to a direct NBC attack on the US or its Allies by another country (an attack that could directly threaten their survival--Note, however, that a limited chemical or biological attack could provoke a devastating conventional response with the option to employ nuclear weapons if deemed necessary)¹⁰⁸

According to Glen Buchan, in US Nuclear Strategy for the Post-Cold War Era, the first point refers to deterring, defeating, or punishing WMD attacks in theater where respective forces are at risk.¹⁰⁹ In this case, TNWs might be an appropriate choice if other options are unproductive. Additionally, in the first two situations, he believes that there are very few regions in the world that are important enough for these sort of situations to arise. His belief is based on the contention that if the US and the Alliance plans its conventional forces properly, this problem should never occur.¹¹⁰ I would argue that the US and the Alliance should always keep their options open to apply the necessary force mix to any given situation. The third situation is possible, but not likely any time in the near future. But if the US or its Allies find themselves threatened by an emerging regional threat armed with NBC, the option of a preemptive strike will still be worth considering. The last point is pretty much straight forward, and has been the basis of US deterrent strategy since the advent of the nuclear age.¹¹¹ It is also unlikely that an overtly aggressive act by another country other than a nuclear attack could directly threaten the national survival of the US or NATO.¹¹²

In sum, this chapter has examined some of the implications of Russia's remaining nuclear capability and its impact on the future strategic balance in Europe, as well as emerging NATO policy considerations that are likely to include the option of using TNWs as part of a future force mix to deter regional NBC threats. Specifically, Russian TNWs still pose a threat to the US and NATO Alliance because of the risks involved with the security of the Russian nuclear complex and accountability safeguards. This assertion is largely based on Russia's increased reliance on TNWs in the face of a precipitous post-Cold War decline of their conventional capability and due to the increased susceptibility of TNWs to theft, subterfuge, and unauthorized use. Likewise, the threat of WMD proliferation and employment against the Alliance's

periphery presents new challenges to its defensive strategy, and greatly influences NATO decisions on the option of using nuclear weapons as the ultimate form of deterrence. Bottomline, is that NATO's nuclear posture, as well as its strategic concept, will continue to be reviewed in terms of the evolving threat to European security. Presently, although there remains a number of strategic concerns, the threat has substantially subsided since the end of the Cold War and has opened the door to more dramatic arms reductions, as witnessed by the withdrawal of 90 percent of TNWs from NATO territory since 1991, and the welcome consolidation and reduction of TNWs in Russia. Given these circumstances, have we reached a moment in history when conditions are now favorable to move toward even further reductions in TNWs or even contemplate the withdrawal of remaining US TNWs from Europe? What are the options? What creative steps can the US, Russia, and NATO propose or take to further reduce TNWs on the European continent, as each in their own respective ways struggle to adjust to a post-Cold War environment? These are just a few of the questions that will be examined in the following Chapter.

IV. Creative Steps for the further Reductions in TNWs

While the preceding chapters focused on the historical underpinnings in the deployment of nuclear weapons to Europe, the development of NATO's nuclear strategy, and principal threats to, and conceivable responses by NATO, this Chapter seeks to explore, develop, and evaluate creative steps/proposals for consideration in the further reduction of TNWs in Europe. These steps/proposals fall into four general areas to include: formalization of the 1991 unilateral declarations; establishing a reduction and verification regime; alternative assurances through reconstitution and substitution; and deployment limitations and nuclear weapons free zones (NWFZs). Bare in mind, however, that it is impossible in this short Chapter to examine thoroughly the obstacles which may prove problematic in implementing the proposals presented, or to fully elaborate all of the possible alternatives to overcome inherent difficulties.

Formalization of 1991 Unilateral Declarations

At the Helsinki Summit on 20-21 March 1997, Presidents Clinton and Yeltsin signed joint statements for future reductions to their respective nuclear forces, some which could have far-reaching implications for an evolving US-Russian strategic relationship. Of the three basic points of agreement laid out in the START III framework, the most striking will explore possible control measures relating to SLCMs and TNWs, to include appropriate confidence-building measures. Reportedly, "the US sought discussions on TNWs, where the Russians may have as much as a 10-fold numerical advantage, primarily to better understand the extent of implementation by Moscow of the 1991 and 1992 pledges to withdraw large numbers of TNWs from its operational forces."¹¹³ Both Russia and the US have argued about the significance of TNWs as strategic nuclear systems go to lower levels stating, "...as we go down to lower levels of deployed systems, the non-deployed and non-covered systems gain in significance, and we've got to begin to take a look at the hedge, the stockpile, the TNWs, the nuclear SLCMs, which are not explicitly dealt with in the reduction of deployed systems--the value of these stockpiles... is greater as deployed levels reduce."¹¹⁴

Could this latest approach in negotiations portend to the moment we have been waiting for? If successful, these measures--once identified and agreed upon--will surely be the catalyst to transform the 1991 unilateral arms reduction declarations into a legally-binding treaty. Moreover, "separate arms reduction declarations to START III could establish steps toward the total withdrawal of TNW warheads and, in conjunction with negotiations on warhead elimination, the eventual disarmament of these weapons.

As most arms control advocates would agree, the 1991 unilateral arms reduction declarations as they stand now--albeit absolutely positive in nature and having greatly contributed to raising the nuclear threshold--are neither verifiable nor irreversible.¹¹⁵ According to Potter, this "is a policy that has been advocated by some Russian officials as an appropriate response to NATO expansion." Viktor Mikailov, Former Russian Federation Minister of Atomic Energy, even goes so far as to say that if NATO poses a real threat, "we may have to announce our withdrawal from the treaty on the elimination of medium and shorter range missiles and resume manufacture of these arms, if the threat becomes real."¹¹⁶ If these sentiments were to be realized, one can safely assume that Russia will withdraw their commitment to conclude the agreements already stipulated under the 1991 unilateral declarations.

Taking these perceptions into consideration, the US and the Alliance should take the first step (s) to enhance nuclear cooperation. Avenues for this approach could start off with "opening routine discussions... within the Alliance in the interest of greater transparency." Kelleher, in Nuclear Deterrence and European Security argues, "moving in the direction of greater transparency would be the first step toward further agreement with Russia in reductions... but one that poses difficulties in implementation."¹¹⁷ These difficulties stem from acceptance by Allies, problems in the area of format, and the inability to clearly distinguish barriers to transparency.¹¹⁸ At a minimum, as confidence-building measures, both sides could consider the exchange on a regular basis information on weapons inventory and nuclear materials, exchanges in personnel, and the establishment of reciprocal monitoring facilities at related sites within their respective nuclear complexes. Also, both sides could agree to dismantle a substantial number of their TNWs inventory in a verifiable and monitored manner. The next step then, would be to begin

identifying the contents of a verification and reduction regime that can incorporate the elements of the 1991 arms reduction declarations.

Verification Regime

Similar to START III, the verification regime for the further reduction and elimination of TNWs should fully exploit potential cooperative measures to provide the desired level of transparency, build added confidence, and defuse any situation that could potentially destabilize the US-Russian strategic relationship. Equally important is that we do not shy away from a rigorous inspection regime. The time has come to initiate a dialog between the US and Russia so that an agreement can be reached to institute an effective verification system and bring immediate benefits—trust through verification. The sooner both sides can implement a systematic verification regime, the greater will be the confidence in the security of nuclear materials and the European strategic landscape. This should not be an insurmountable task since both sides have weathered Cold War experiences from the Limited Test Ban negotiations in the 1960s, SALT, START, and INF negotiations in the 1970s and 1980s, to more recent arm control negotiations to regulate WMD. Essentially, there are two types of verification—intrusive and non-intrusive. Intrusive verification covers a variety of means such as onsite and surprise inspections, tagging, and permanent sensors in facilities. Non-intrusive verification involves National Technical means (NTM).

As already mentioned, a measure that might help to initiate a dialogue would be the codification of the 1991 declarations. Also, it could possibly include an obligation by Russia not to deploy TNWs in Belarus.¹¹⁹ Likewise, for NATO, a new verification regime would ensure that Russia's TNW are not increased, or modernized, that they are not deployed to the west of its territory, and that numbers and location of the TNW are known and verifiable.¹²⁰ However, developing a reliable verification regime is a difficult and somewhat delicate task. Sokov in his Tactical Nuclear Weapons Elimination: Next Step for Arms Control, points to several verification challenges: verifying the absence of nuclear weapons in territories of Eastern Europe and Belarus is probably the easiest; monitoring the central storage facilities outside the non-nuclear zone, where warheads are being stored (to include the whole territory of both sides); and the deployed warheads in storage facilities at military bases.¹²¹ Additionally, specific measures

might include: exchanges and periodic information updates; extensive baseline inspections to verify accuracy; on-site inspections at declared facilities, to confirm elimination of warheads; challenge inspections at undeclared facilities to verify absence of warheads; and the use of national technical means. All of these measures can further be enhanced by other confidence-building measures and should generally follow the verification guidelines of the Canberra Commission Report on the Elimination of Nuclear Weapons, Annex on Verification. If these measures can be successfully negotiated, greater confidence can then be held in a secure nuclear weapons complex.

Hence, the political relationship permitting, both the US and Russia should be able to negotiate both verifiable and irreversible measures that will facilitate the further reduction of TNWs and promote a more cooperative and secure military/political European environment. Most importantly, it should be noted “that no verification system can be perfect, it is inevitable that some risk will have to be accepted...”¹²² Just as an example, since TNWs are relatively small and portable, and difficult to detect, a verification regime that would be tasked to provide high confidence of locating these materials would find it extremely difficult to achieve.

Alternative Assurances: Reconstitution and Substitution

As specified by the Alliance’s new Strategic Concept, the Alliance “...will maintain adequate substrategic forces in Europe which will provide an essential link with strategic nuclear forces, reinforcing the transatlantic link. These will consist solely of DCA which could, if necessary be supplemented by offshore systems.”¹²³ However, in the absence of a monolithic threat to the survival of the US and NATO, other alternative assurances need to be considered that may possibly lead to the further reductions of TNWs in Europe. Three proposals worth considering are reconstitution, substitution, and quantitatively and qualitatively improved conventional munitions. Not to be forgotten is that regardless of the state of withdrawal of US TNWs, a US ground force presence will always be available to Europe. For its presence that is truly fundamental to NATO’s new strategic concept. Ground forces in essence play the coupling role and along with nuclear weapons have served as the most credible guarantee to security since their arrival in the 1950s.

Reconstitution. As brought forth by Lambert and Miller, maintaining a robust ability to reconstitute US TNWs following their withdrawal from Europe, may appeal to Allies as part of an updated strategic concept. One obvious benefit of such a structure is that it would not require significant changes to NATO's command and physical organization.¹²⁴ Principally, NATO would retain its consultation mechanisms and associated facilities—albeit without weapons. The only major difference is that the force would have to be redeployed during times of emergency in order to fulfill its deterrent role.¹²⁵ Additionally, the assurance of reconstitution also takes with it some criticism. According to Lambert and Miller, there are three arguments: one centers on the fact reconstitution amounts to a major step in crisis escalation by clearly signaling the contemplated use of nuclear weapons; secondly, it would be difficult to achieve Alliance consensus in the limited amount of time available during a crisis; and finally, the need of preexisting agreements with Alliance members to streamline the process.¹²⁶ Another problem that could surface over time would be logistical challenges.

Conversely, it could be argued that maintaining an ability to reconstitute nuclear forces from abroad, could increase survivability, be effectively used to send a clear signal to show US resolve and will to use TNWs, and continue to promote a viable deterrent strategy. Moreover, it should not be difficult to convince our Allies that the US nuclear guarantee is still intact. This can be accomplished by instituting an effective evaluation and exercise program that is routinely tested to maintain the requisite qualifications to prosecute the operations.

Substitution. The second proposal for an alternative assurance of extending deterrence to our European Allies is to substitute our offshore systems (SLCMs) for DCA, if not outright reverse their roles where DCA are a supplement to attack submarines loaded with TLAM/Ns. This is by far not a new conceptual framework. In fact, the US has always sought to maintain a balanced force of TNWs. In the late 1970s, the US researched possible options to maintain NATO's linkage to US strategic weapons by employing a mix of weapons. One of those weapons systems to be considered for NATO was the SLCM. Although rejected for a number of reasons the system has been employed by the US Navy for theater-wide nuclear roles up to 1991.

Additionally, Andrew Goodpaster, Chairman of the Atlantic Council of the United States stated,

Ultimately, perhaps there could be reliance by the US on submarine-based weapons for our nuclear contribution to security, backed by the ability of nuclear-capable US Air Forces to redeploy quickly from the US if needed. Such a posture seems far in the future, however, and will be dependent on continued improvement of US-Russian relations...¹²⁷

To date, UK has realized the utility of Tridents in a substrategic role and have already marked the withdrawal of their DCA from the TNW role by the end of 1988. As a result, their force will be purely sea-based. Since the US operates similar systems, one can surely speculate that depending on future force structure considerations, the US too could opt to employ or dedicate an unspecified number of attack submarines to a substrategic role.

Other benefits of substituting attack submarines for DCA are that the US and NATO would have less host country opposition, and greater confidence in pre-launch survivability while maintaining an effective, credible deterrent against conventional and WMD threats.¹²⁸ However, they too do not come without criticism to include: reliance on off-shore systems could lead to a particular operational shortfall; TLAM/N's lack the low CEPs and is therefore unsuitable for hard target kills; SLCMs and their technology present problems for arms control in terms of the ability to verify and monitor; and if the Navy is going to assume a greater role in the Defense of NATO, it will have to consider cost constraints, technical improvement, launch platform availability, and the importance of deep-strike missions into Russian territory in support to NATO's strategic concept.¹²⁹ Overall, NATO can only benefit from the substitution of DCA by off-shore systems--both as a nuclear deterrent and political tool. Granted, the effective dismantling of the NATO land-based TNW force structure in this manner would create a situation in which deterrence in Europe would thereafter be based essentially on American and UK off-shore systems and French nuclear forces, whose nuclear tasked aircraft would be the only land-based nuclear forces in NATO Europe... regardless, our ability to deter will prevail based on our unified resolve and will to use TNWs should the Alliance ever be called on to break the nuclear threshold.

Nuclear vs. Conventional. In the context of future regional threats (rational or irrational) armed with NBC weapons and ballistic missile delivery systems, some analysts both inside and outside the US defense establishment are embroiled in an ongoing debate over the continued reliance for TNWs

considering the qualitative and quantitative improvements in accuracy and destructive power of precision guided munitions. As demonstrated during the Gulf War, the US investment into conventional precision-strike capabilities to destroy Iraq's WMD and essential warfighting capabilities paid off. As a result, a growing number of analysts believe advanced conventional forces now possess the capability to deter NBC aggression.¹³⁰ This line of thought may have some merit, but it fails to address the vulnerability of our US forces abroad to NBC strikes or the fact that using conventional threats in the place of nuclear weapons to deter any future NBC attack poses a number of problems.

First, improved conventional capabilities usually enjoy only limited success because countermeasures are quickly developed to negate their advantage. Second, adverse weather, geographic, and operational conditions (i.e., lack of ground or air superiority) may prohibit effective use of precision-strike capabilities. Third, the ability to accurately and timely place mobile targets--targets that remain relatively invulnerable to conventional attack--at risk. Fourth, the destruction capability of conventional weapons does not match the perception of the destructiveness of a nuclear weapons. As an example, TNWs are effective against soft, hard and deeply-buried targets, whereas conventional weapons are only effective against some hard targets. Fifth, the deterrent effect of conventional threats are far more ambiguous than a nuclear threat and may require increased international support for conventional operations. Sixth, conventional weapons effects may not produce the psychological effects (shock, demoralization, destruction of the aggressors will to fight) as nuclear weapons. Seventh, "the limits of conventional deterrence of WMD attacks are especially apparent under circumstances where the attacker is already experiencing the effects of US conventional strikes as part of an ongoing war, or has already decided to risk such strikes."¹³¹ Finally, "conventional retaliatory threats and defenses, to be sufficiently compelling, may be too costly to implement - politically, financially, and militarily."¹³²

These extreme costs, combined with a perception of reduced US security assurances, may contribute to less than-perfect protection measures or cause regional allies, as well as other countries to pursue a more affordable means of defense--possibly involving the acquisition or employment of nuclear weapons. Therefore, based on these problems and in view of the high-costs associated with future limiting damage options, it is critical that the US maintain a credible deterrence capability--combining the employment

options of conventional forces and TNWs--to deter future NBC threats against the US and its allies, and preclude the wider proliferation of nuclear weapons. But if deterrence options fail because they are perceived as inadequate by an aggressor, what kinds of situations could develop that would lead to the US in threatening the use of, or use of TNWs.

Deployment Limitations/Nuclear Weapon Free Zones

Deployment Limitations. In the recent past, during arms control negotiations, Russia wanted the creation of a joint statement that would allow for the exploration of possible reductions or operational constraints on TNWs and SLCMs. Specifically, their focus has been to establish limits on deployment locations or range capabilities of TNWs. However, the US wants any measures relating to TNWs and nuclear SLCMs limited to confidence-building and transparency measures.

According to Jacquelyn Davis, Charles Perry, and Andrew Davis in The Looming Alliance Debate over Nuclear Weapons, “it is possible that limitations on the numbers or deployment modalities of TNWs in Europe could be negotiated in the near future with obvious implications for the NATO strategic concept and nuclear risk-sharing in the Alliance. Hence, while maintaining a low-profile policy with regard to TNW forces, the Alliance nevertheless needs to quietly consider its options...”¹³³ The probabilities on reaching some kind of agreement on deployment limits are definitely worth considering since not only Russia is interested in applying yet unidentified arms control measures to NATO TNWs.¹³⁴ Likewise, the US and its Alliance members would like to see a marketable reduction in Russian TNWs, as well as placing the remainder of these weapons under strict transparency and control regimes.¹³⁵ Based on the analysis of the threats to NATO, the aforementioned desires are primarily due to the tenuous state of control over the Russian nuclear complex and the military’s fall from grace since the end of the Cold War.

Nuclear Weapons Free Zones. If expansion of NATO cannot be avoided, one promising approach which could induce further cooperation and negotiations for deeper reductions in TNWs, if not total elimination, is the creation of a Eastern European Nuclear-Weapon-Free Zones (NWFZ).

Background: According to a Canberra Commission report on the elimination of nuclear weapons, the Commission contends that “nuclear-weapon-free zones are part of the architecture that can usefully encourage and support a nuclear weapon-free world.”¹³⁶ It states further, that “the spread of nuclear-weapon-free zones around the globe, with specific mechanisms to answer the security concerns of each region, can progressively codify the transition to a world free of nuclear weapons.”¹³⁷ The NWFZs are codified by treaty, along with associated protocols contained therein, which prohibit testing, manufacture, acquisition or stationing of any nuclear device, as well as ocean dumping of radioactive waste in the zone.¹³⁸ Additionally, once ratified, they can obligate the respective parties to refrain from using or threatening to use any nuclear device against treaty parties within the zone--similar to negative security assurances observed in the Non-Nuclear Proliferation Treaty (NPT) which pledges not to use or threaten the use against non-nuclear weapon states.¹³⁹ Like other measures, there are several weaknesses with NWFZs. They are as follows:

- It unrealistically has to assume the existence of “generous” nuclear powers
- Zone members have no clear method to enforce compliance or alternative, prevent noncompliance
- Nuclear Nation signatories may elect to withdraw their support
- Major nuclear powers may respect a zone only to the point that it is in their combined interest not to cross the “nuclear threshold”
- The zone could not penalize a guilty party once identified
- Nuclear states have not had adequate incentives to change their option to decide a conflict with nuclear weapons
- Covert successful weapons programs could be conducted by a zonal member
- NFWZs cannot control the technical capability of long range systems
- Does not regulate those weapons launched from sea or air platforms located away from a zone.
- Does not change the perception of what is needed as a deterrent¹⁴⁰

Of all the proposals sponsored to date--either by Russia or one of its Clients--Europe is perhaps the area where NWFZs have caused the most distress.¹⁴¹ For the Russians, a NFWZ could satisfy four objectives:

- Limit the nuclear arms race and strengthen the nonproliferation of nuclear weapons regimen
- Reduce the quantity of armed forces and armaments in the given area
- Enhance confidence and good neighborliness between states in the zone, and establish a politically stable relations between them
- Consolidate European and general security¹⁴²

Two of the US criteria, however, were not met by any of the proposals were “that all states whose participation is deemed important should participate and that establishment of a NWFZ should not disturb existing security arrangements to the detriment or regional and international security. Furthermore, the inclusion of NATO members in many of the proposals clearly disturbs existing security arrangements and contradicts the fundamental principle that NATO is an indivisible strategic identity.”¹⁴³

Such a zone was proposed by Belarus at the United Nations General Assembly in 1990 and reiterated at the Nuclear Nonproliferation Treaty review conference.¹⁴⁴ According to the proposal, the zone would have included Poland, the Czech Republic, the Slovak Republic, Hungary, Baltic states, Belarus, Ukraine, and possibly Moldova. It also left open the option for including the Balkans and Scandinavia. Potter, believes, “creation of the zone would not alleviate Russia’s concerns about NATO’s smart conventional weapons... however, it could be viewed by the Russian’s as a confidence-builder.”¹⁴⁵

NWFZs, however, create a dilemma for Official US policy. Although NWFZs reinforce the global non-proliferation consensus, it is also perceived that they add to the momentum behind denuclearization well before nuclear powers are prepared to relinquish their own nuclear weapons.¹⁴⁶ To date, official US policy toward NWFZs is to judge each zone on the basis of seven criteria: (1) Proposals for NWFZs should originate from states within zone; (2) all relevant states in a zone should participate; (3) adequate mechanisms for verifying compliance must exist; (4) zones should not disturb existing security arrangements; (5) zones should prohibit the development or possession of any nuclear explosive devise; (6) zones should not infringe on the exercise of rights recognized under international law, particularly the freedom of navigation, innocent passage and overflight; and (7) zones should not affect the rights of parties to grant transit privileges, port calls or overflights.¹⁴⁷ Even if all these criteria are met, it does not warrant immediate US participation.¹⁴⁸ In addition to the aforementioned seven criteria, several other important military considerations are basic to the US evaluation of any NWFZ proposal. These include:

- The strategic location of the proposed zone
- The Russian military influence in the area
- The ability of the US to deter an outside threat to the area; the proximity of forces, both potentially friendly and adversarial
- The impact of giving up the option of TNWs in the area
- The terms of the proposed treaty in relation to the actual prohibition on stationing weapons in the zone, overflight rights, ports access, and innocent passage¹⁴⁹

Proposal. An approach that may benefit both the US and Russia is the creation of an Eastern Europe NWFZ to include the Baltics, Belarus, Ukraine, Moldova, and the Caucasus. This proposal to create a NWFZ in Eastern Europe is a positive response to new conditions that merits consideration by both the US and Russia. Both Russia and the US would have three choices in dealing with this proposal if enacted: observe the requirements and not operate nuclear weapons in the region; ignore the NWFZ entirely or partially; and refrain from operating in the region entirely.¹⁵⁰

Conditions for Implementation. When carefully examined, it meets most goals, is not threatening or provocative, could lessen Russia's reliance on its TNWs, creates a buffer between an expanding NATO and Russia's door, will not degrade command and control of Russia's dispersed TNWs, and does not impact on NATO territory. Moreover, the East European NWFZs can be used as an instrument of nonproliferation in that it offers a means to overcome NPT weaknesses and discriminatory effects. Additionally, it can contribute to both sides national security concerns.

Obstacles. Although Ukraine and Belarus have strongly supported the establishment of such a zone in the past, eagerness to join NATO may well induce the Eastern democracies to pay the nuclear membership price and refuse to enter into NWFZ arrangements, thereby setting the stage for a re-emergence of TNW tensions over the expansion of NATO and confrontation with Russia. Additionally, Russia may view the establishment of an Eastern Europe NWFZ in the US favor. Lastly, until a rearrangement and full accounting of Russian TNWs occurs, there is little reason to think NATO will adopt a different strategic concept for different regions of Europe.

In sum, this Chapter examined creative steps/proposals for consideration in the further reduction of TNWs in Europe. In the formalization of the 1991 unilateral declarations, the first and most critical avenue for this approach should start off with opening routine discussions within the Alliance in the interest of greater transparency and to begin identifying the contents of a verification and reduction regime that can incorporate the elements of the 1991 arms reduction declarations. Once established and accepted by all sides, a verification regime for the further reduction and elimination of TNWs should fully exploit potential cooperative measures to provide the desired level of transparency, build added confidence, and defuse any situation that could potentially destabilize the US-Russian strategic

relationship. In terms of alternative assurances through reconstitution, substitution and conventional options, each of these proposals can be effectively used as potential models for the development of future force structures, and as a means to determine both military and political implications should the unilateral withdrawal of TNWs occur. The last proposal concerning deployment limitations and NWFZs, by far, is most unlikely, but identifies yet alternative considerations which are highly dependent on the European strategic relationship and the willingness of the zonal parties to fully cooperate with the imposed conditions.

V. Conclusion

Since the beginning of the Cold War to the present, there has been a dramatic change in the European geopolitical/military environment. A change that refocused the US and NATO's attention away from a major peer competitor to the a regional threat armed with nuclear, chemical, and biological weapons and ballistic missile delivery systems threats. Similarly, the US and its NATO alliance members have witnessed an evolution in the role of TNWs as a warfighting ability, from the time of their first deployment in the 1950s, up to a political tool in the deterrent kitbag of the '90s. Moreover, with almost a 90 percent reduction of US TNWs from NATO's soil, the absence of a peer threat, and when coupled with the increased relaxation of tensions between the US and Russia, it has become profoundly difficult for key American and European decisionmakers to articulate reasons on whether or not there still exists a requirement to reexamine our military and deterrence strategy concerning the future role and employment of TNWs systems abroad.

Additionally, impending budget and force restructuring cuts raise the question on whether a tactical role for nuclear weapons is in fact still feasible. Outside of the counterproliferation cottage market inside the beltway, only the enlargement of NATO has drawn any attention to the utilization or role of remaining TNWs.

Utility of TNWs

Just as NATO recognized in the late 1950s, that a true mix of nuclear and conventional weapons provide the best deterrence--the same holds true today. However, it comes at a steeper price and does not necessarily require the forward deployment of US TNWs. In the wake of a substantially reduced conventional threat, NATO's opportunity to consider other innovative approaches in the development of its Strategic Concept is upon us. Creative steps/proposals worthy for consideration in the further reduction of TNWs in Europe include: formalization of the 1991 unilateral declarations; establishing a reduction and verification regime; alternative assurances through reconstitution and substitution; and deployment limitations and nuclear weapons free zones (NWFZs). Meanwhile, in the foreseeable future,

as long as some nations possess nuclear, biological or chemical weapons, it can be safely assumed that competing neighbors will try to acquire them. TNWs, in this case, provide an indispensable alternative in deterring the threatened use of WMD against national interests. Moreover, when coupled with a superior conventional capability, theater missile defense, global consensus, and a highly survivable second strike capability, TNWs will continue to enhance the ability to properly safeguard our interests abroad and on the periphery. However, we need to take advantage of all the conceivable options in the use of TNWs.

As discussed throughout this monograph, other reasons for the continued utility of nuclear weapons are as follows:

- Although the Soviet Union has collapsed, the reemergence of a revanchist Russia should not be discounted

- They act as a deterrent against rogue states which may acquire or develop WMD
- They provide security and stability
- They need to be retained in order to control geopolitical competition in certain areas as Europe, wherein the absence of nuclear weapons such competition might become more intense

- The possession of nuclear weapons grants certain nations a unique status in the international arena

- Nuclear weapons need to be retained in order to avoid large-scale conventional conflicts between major nuclear powers

- A narrowing of nuclear roles and reductions in nuclear forces can encourage proliferation.¹⁵¹

Meanwhile, these factors, when coupled with the idea that traditional concepts of deterrence have also been eroded in the wake of qualitative advances in conventional capabilities and in the absence of a viable threat to our survival, suggest that careful investigation needs to be made to determine our future reliance on TNWs and into future opportunities to further reduce existing inventories.

Key Observations

Future Role of TNWs. As the debate on the viability of TNWs into the 21st century continues, the decisions on several interrelated issues will have a profound impact on the role of these weapons: clearly

outlining the future role of theater nuclear weapons in US military strategy; articulating the military and political rationales for maintaining the capability; developing a long-term nonproliferation strategy to include considerations on the employment of theater nuclear weapons; and ensuring a credible deterrence strategy against NBC armed regional threats. Meanwhile, we must be cognizant of the fact that nuclear weapons are likely to play an increasing role in Russia.

Future Force Structure. Consideration of future NBC armed threats should become a critical factor in defining the shape and design of future forces. From now until well into the 21st Century, the US should retain a limited number of TNWs, yet to be determined, as part of its deterrence strategy to hold future aggressors at risk. This is largely based on a flexible response strategy that requires that the US maintain a broad spectrum of nuclear weapon employment options available for planning..

Nuclear Employment Policy. US and Allied defense planners must carefully analyze the constantly changing geopolitical and military landscape to ensure well-informed decisions on actions that may warrant a redesign of existing deterrence strategies to developing regional challenges. Specifically, we must be prepared to develop and update regional and regime-specific deterrent strategies taking into account a broad spectrum of internal and external dynamics of the potential aggressor that is critical to achieve success.

US Security Guarantee. Given the projected increase of potential threats armed with NBC over the next 10 to 15 years, the US needs to closely examine its extended nuclear security guarantee to its allies, weigh the potential costs, alternative options, and determine if the forward deployment of TNWs will remain a central feature of future US and NATO defense strategy.

Alternative Considerations. Should alternative (Reconstitution, substitution, or advanced conventional weapon capabilities) options prove just as capable in both a deterrent and warfighting role, and seen as politically acceptable among our allies and coalition members, only then should considerations be entertained on the withdrawal and eventual elimination of TNWs. If and when the US decides to eliminate its remaining TNWs, it must be prepared to look toward other nuclear weapons systems (i.e. off-shore systems) to pick up “the role once assigned to TNWs, should the need arise.”¹⁵² Until that time, however, the US must be prepared to employ TNWs as one of its many deterrent tools to

deter future NBC threats. Bottomline is that from now until well into the future, the combination of conventional precision-strike weaponry and TNWs still act as a defining influence during uncertain times.

Endnotes

¹ For the purpose of this monograph, the acronyms WMD and NBC will be used interchangeably, but a noted distinction between the two is as follows: The term "weapons of mass destruction" (WMD) refers to nuclear, biological, and chemical weapons employed for the purpose of inflicting massive damage, including the killing of large numbers of civilians. The term consolidates nuclear, biological, and chemical weapons into one category because, despite differences in their effects and use, they share enormous lethality and symbolism. Thus the concept of WMD is significant in a political rather than a military sense. By using the term "WMD," policymakers convey the message that the proliferation of these types of weapons is unacceptable and that their use would be considered an extremely grave matter. However, for military operational purposes, a distinction must be made when considering the threats posed by nuclear, biological, and chemical weapons. The acronym NBC recognizes these differences. Also, "WMD" is an open-ended concept, potentially allowing for the development of other technologies of mass destruction (i.e., improved ballistic missile delivery and accuracy, and capability, and greater conventional warhead effectiveness). "NBC" is necessarily confined to the three named technologies. Nuclear weapons are the most lethal and the least easily defended against... The use of biological weapons carries with it a potential for the loss of life that approaches that of nuclear weapons; however, biological arsenals can be combated to some degree with vaccines, masks, and proper warning. Chemical weapons are the least lethal... but can still have a profound effect on the battlefield or on civilian populations if used in sufficient quantities. Troops can defend themselves against chemical weapons with chemical detectors and protective clothing, but such equipment undermines operational effectiveness. National Defense University, "Countering Weapons of Mass Destruction," Strategic Assessment 1996, (Wash, D.C.: NDU Press, 1996): 201.

² Department of Defense, JCS Joint Pub 1-02, Department of Defense Dictionary of Military and Associated Terms, (1 May 1997), 527.

³ John Midgley, Deadly Illusions: Army Policy for the Nuclear Battlefield, (London: Westview Press, 1986), x.

⁴ Wolfgang Heisenberg, "The Alliance and Europe: Part I: Crisis Stability in Europe and Theater Nuclear Forces," Adelphi Paper 96, (London: International Institute for Strategic Studies, 1973): 34.

⁵ "The Military Balance 1974/75," The International Institute for Strategic Studies, reprinted in Air Force Magazine, Vol. 57, (December 1974): 88.

⁶ Jeffrey Record, US Nuclear Weapons in Europe, (Washington: The Brookings Institution, 1974), 7.

⁷ Thomas Citron, William Arkin and Milton Hoenig, Nuclear Weapons Handbook, Vol. 1, US Nuclear Forces and Capabilities, Natural Resources Defense Council, Inc., (Cambridge, MA: Ballinger Publishing Co., 1984), 28.

⁸ According to Lawrence Freedman, terminology in this area is notoriously difficult. As it became clear that the notion of a tactical nuclear weapon was intellectually suspect, the term theater nuclear force was adopted, which classified the weapons by location rather than by role. It was then necessary to distinguish between the longer-range theater systems that would be used against targets well to the rear of the battlefield and the shorter-range intended for battlefield use. However, many Europeans noted that in all these cases, the comparisons were still being made with intercontinental strategic weapons, which implied that the use of weapons of similar yield against any allies of the two larger powers would be something less serious than strategic. In an attempt to meet such objections the US introduced the term intermediate nuclear forces in 1981. Although many commentators would have been happy to use that instead of what had hitherto been known as long-range theater forces as part of a classification based on range, NATO

complicated matters by referring to the weapons originally known as tactical as short-range intermediate. Meanwhile, outside commentators were increasingly using the more revealing term battlefield to label these weapons. This tedious terminological confusion is relevant only because of the larger doctrinal confusion that it reveals. Lawrence Freedman, "The First Generations of Nuclear Strategists" in Makers of Modern Strategy: From Machiavelli to the Nuclear Age, by Paret, Peter, ed., (Princeton, NJ: Princeton University Press, 1986), 748-749.

⁹ Lowell Stanton, "US/NATO Sea-based Non-strategic Nuclear Deterrence: Paradox or Pitfall?" MA Thesis, Naval Post Graduate School. (Monterey, CA: September 1991), 9.

¹⁰ *Ibid*, 9.

¹¹ *Ibid*, 10.

¹² According to George and Smoke, massive retaliation came to appear to be the strategic theory component of a new US national security policy, the rationale for the force structure of the New Look, and indeed the guiding principle of American strategy for most of the decade of the 50s. It can also be viewed as the first systematic theory of deterrence in the Cold War era. Additionally, Lawrence Freedman felt that the timing of the New Look meant that it turned into a means not only for shifting the balance of American forces from conventional to the nuclear, but also for instituting a nuclear bias in the fabric of NATO forces that thereafter became extremely difficult to remove. George and Smoke, "Deterrence in History," 56. Lawrence Freedman, 744.

¹³ In 1954, US Secretary of State John Foster Dulles announced that the US intended in the future to deter aggression by depending primarily upon the great capacity to retaliate, instantly, by means and at places of our own choosing. This policy became known as massive retaliation and was generally interpreted as a threat to devastate Soviet and Chinese economic and political centers in response to any aggression, no matter how limited. John Foster Dulles, "The Evolution of Foreign Policy," Department of State Bulletin, Vol. 30, 25 January 1954. Behind the emergence of massive retaliation lay three major interrelated factors. First, it was a reaction against the experience in Korea. The US unaccustomed to the frustrations of dirty little wars had by 1953 become thoroughly tired of the cost and stalemate in Korea; the promise of a quick and decisive end to the Korean war had been a major cause of the Republican landslide in 1952. Within the military, an influential group of officers known as the "Never Again Club" was beginning to preach doctrine of no further military involvement by US forces on Asian mainland. Yet, if the concept of containment was to be maintained, some means of projecting power into Eurasia was required. Hence, massive retaliation seemed to provide a plausible alternative to again accepting high casualties during a protracted campaign to defend the lands of the communist periphery. To deter any attack on them, the US threatened to respond with strategic nuclear strikes at the communist heartland. Second, was the question of economic costs during peacetime. The Eisenhower Administration was committed to maintaining low tax rates and a balanced federal budget. This goal was seen as unachievable if conventional forces were to be maintained at the Korean War levels. By comparison, nuclear weapons appeared more efficient; more bang for the buck. Under the policy of massive retaliation, the threat to employ these weapons substituted the need for the far more expensive conventional force buildup. Third, a series of technological breakthroughs in the field of nuclear weapons and their delivery means made it more likely to avoid large conventional limited wars, as with Korea. By 1953, nuclear bombs were plentiful and were being packaged in a variety of yields. Moreover, weapons designers were in the process of generating a rapidly growing family of small to medium yield tactical nuclear weapon that could be delivered in very flexible ways by an increasing variety of delivery means. Bottomline, it posited the basic decision that the US would fight no more high casualty, costly, protracted limited wars without using atomic weapons. George and Smoke, "Deterrence in History," 51-59.

¹⁴ According to Richardson, the proposed strategy would require only 30 combat ready divisions armed with most modern TNWs. The purpose of the Allied ground forces in the new strategy was to effectively

“shield” NATO territory in a defensive holding action using TNWs as necessary, pending the outcome of the strategic nuclear battle, which of course was to be conducted largely between the two superpowers. Robert Richardson, III, “NATO Nuclear Strategy: A Look Back,” Strategic Review, Vol. 9, No. 2, (Spring 1981): 35-43.

¹⁵ Michael Legge, Theater Nuclear Weapons and the NATO Strategy of Flexible Response, (Monterey, CA: The Rand Corp., 1983), 4,

¹⁶ For more detail on the defensive build-up and the “long-haul concept,” see John Foster Dulles, “Policy for Security and Peace,” in John Endicott and Roy Stafford Jr., ed., American Defense Policy, Fourth Edition (Baltimore, Md.: John Hopkins University Press, 1977), 68-70.

¹⁷ Jeffrey Record, NATO’s Theater Nuclear Force Modernization Program: The Real Issues, (Washington, D.C.: Corporate Press, Inc., 1981), 13-14.

¹⁸ Sagan, Moving Targets: Nuclear Strategy and National Security, (Princeton, NJ: Princeton University Press, 1989), 14.

¹⁹ David Schwartz, NATO’s Nuclear Dilemmas, (The Brookings Institution, 1983), 32.

²⁰In 1953, President Eisenhower made official the nuclear emphasis policy recommended by NSC 162/2 and directed the military to base planning on the use of nuclear weapons when the military situation required. Eisenhower’s focus was on the development of weapon systems that could be effectively used on the battlefield in support to the conventional ground forces, principally artillery weapons that can fire nuclear and conventional shells. S. T. Cohen and William Van Cleave, 4. See Bacevich, 82-86 for more information regarding development of the 280 mm cannon as an initial breakthrough and the lessons learned toward the development of other dual-capable weapon systems. One assumption that can be made is that TNWs can best support integrated nuclear with non-nuclear operations if dual capable. Additionally, a dual capable system should allow for greater ease in training, target selection and planning, lessen the transition time from one to the other, and greater flexibility and stability toward the conduct of operations.

²¹ Christopher Campbell, Nuclear Weapons Handbook, Presidio, CA: Presidio Press 1984, 37.

²² Andrew Goodpaster, “Nuclear Weapons and European Security,” Policy Paper. (Washington D.C.: The Atlantic Council of the United States, April 1996): 7.

²³ Their radius of destruction from theater nuclear weapons was too large and their after effects too pervasive to employ them in such a precise and discriminating fashion. This was further clarified once the military began exercising with TNWs. The exercise that really struck home was Carte Blanche, which took place in Western Europe in June 1955. In it TNWs were only used by the NATO side. Over two days 355 devices were exploded, mostly over West German territory. Specifically, it simulated the Western Allies response to Soviet tactical nuclear attacks against military targets in the low countries, northeastern France, and the FRG. The attack scenario was based on the assumption that Soviet Tu-16/Badger medium range bombers would lead an attack by dropping atomic bombs on primary Allied airfields and command facilities. The Allied response simulated dropping more than 100 targets between Hamburg and Munich. Even without the effects of residual radiation, this would have left up to 1.7 million Germans dead and 3.5 million wounded. Freedman, 747 and Catherine Kelleher, Germany and the Politics of Nuclear Weapons, (Columbia University Press 1975), 40.

²⁴ See Catherine Kelleher, in her book Germany and the Politics of Nuclear Weapons for more information on the German reaction to Carte Blanche. According to Catherine, most German defense officials concluded, “Nuclear weapons would not play a decisive role in such a conflict; their primary

significance would be in the strategic sphere, especially in retaliatory attacks against the Soviet homeland. The new TNWs--about which very little was known--might provide increased strength once problems of radiation effects, reliability, and logistics could be solved." Kelleher, 41.

²⁵ Shlomo Aronson and Oded Brosh, The Politics and Strategy of Nuclear Weapons in the Middle East: Opacity Theory and Reality, 1960-1991, and Israeli Perspective, (New York: State University of New York Press, 1992), 28.

²⁶ Kenneth Waltz states, "much of the literature on deterrence emphasizes the problem of achieving the credibility on which deterrence depends and the danger of relying on a deterrent of uncertain credibility. One solution was found in Thomas Schelling's notion of "the threat that leaves something to chance." Scott Sagan and Kenneth Waltz, The Spread of Nuclear Weapons: A Debate, (New York: W. W. Norton & Company, 1995), 23-24. Thomas Schelling, The Strategy of Conflict, (New York: Oxford University Press, 1963, 187-203.

²⁷Richard Hooker and Ricky Waddell, "The Future of Conventional Deterrence," Naval War College Review (Summer 1992): 79.

²⁸ Freedman, 772.

²⁹ Each of the 25 ships were to be armed with 8 Polaris A-3 missiles with a range of 3,000 miles. Charles Clayton, An Analysis of the MLF as a Solution to NATO's Nuclear Political Problem. US Army War College, Carlisle Barracks, PA: 8 April 1966, 15. Also see Raymond Aron, "Why Europe Fears Us," The Atlantic, Vol. 214, (December 1964): 47-52.

³⁰ Catherine, Kelleher, "NATO Nuclear Operations," in Ashton Carter, et al., ed., Managing Nuclear Operations, The Brookings Institution, 1987, 247-269.

³¹ Paul Buteux, The Politics of Nuclear Consultation in NATO-1965 to 1980, Cambridge University, 1983, 13.

³² Legge, 26.

³³ Paul Nitze, former Deputy Secretary of Defense (1967-1969) of the following 10 levels of potential violence:

Strategic Nuclear Forces	1. Intercontinental, primarily countervalue, nuclear war
	2. Intercontinental, primarily counterforce, nuclear war
Theater Nuclear Forces	3. Theater nuclear war in which intermediate gray area weapons, such as SS-20, Backfire, FB-111, intermediate range cruise missiles are used
	4. Forward Edge of the Battlefield (FEBA) nuclear war with both sides primarily using shorter range weapons close to the line of contact between opposing forces; neither superpower using its intercontinental or gray area weapons, and both superpowers avoiding the territory of the other
	5. Unilateral use by the country attacked of TNWs in self-defense on and over its own territory

Conventional Forces	6. Conventional war with both superpowers participating
	7. Conventional War with only a single superpower actively participating
	8. Conventional War with client states only participating
	9. Civil war or guerrilla war in its various forms
	10. Political, economic, and psychological warfare

Paul Nitze, "The Relationship of Strategic and Theater Nuclear Forces," International Security, Vol. 2., (Fall 1977): 122.

³⁴ First, was the ratification of the Intermediate-Range Nuclear Forces (INF) treaty in 1987, which called for the elimination of all ground-launched ballistic missiles, which were a part of the theater nuclear weapon arsenal. Secondly, the Conventional Forces in Europe Treaty signed in 1990, led to the dramatic reduction of conventional forces within theater and represented another turning point in the end of the Cold War. Both of these treaties were meant to create a more stable and secure balance in Europe and eliminate disparities between deployed forces in theater. US participation was also intended to encourage greater participation by Russian forces to make additional cuts in impending Strategic Arms Reductions Talks.

³⁵ Sagan, 52.

³⁶ Ibid.

³⁷ Desmond Ball, "The Development of the SIOP, 1960-1983," in Strategic Nuclear Targeting, ed., Desmond Ball and Jeffrey Richelson (Ithaca and London: Cornell University Press, 1986), 59.

³⁸ Sagan, 52.

³⁹ William Savage, "Strategy Implications of SDI," in Essays on Strategy IV, by National Defense University, (Wash D.C.: NDU Press, 1987): 28.

⁴⁰ W. Bruce Weinrod, ed., "Assessing Strategic Defense--Six Roundtable Discussions," The Heritage Lectures #38, The Heritage Foundation, (1985): 95.

⁴¹ Aeron Friedberg, "A History of the US Strategic Doctrine, 1945-1970," Military Strategy National Security Management Series, National Defense University, (Wash, D.C.: NDU Press, May 1983): 164.

⁴² James Schlesinger, "Flexible Strategic Options," in John Endicott and Roy Stafford Jr., ed., American Defense Policy, Fourth Edition (Baltimore, Md.: John Hopkins University Press, 1977): 84-86.

⁴³ Legge, 30.

⁴⁴ Buteux, 151.

⁴⁵ The Modernization of NATO's Long Range Theater Nuclear Forces, Report prepared for the Subcommittee on Europe and the Middle East of the Committee on Foreign Affairs of the US House of Representatives, Congressional Research Service, US Government Printing Office, 1981, 23.

⁴⁶ Jean Reed, "NATO's Theater Nuclear Forces: A Coherent Strategy for the 1980's," National Security Affairs Monograph Series 83-8, National Defense University, (Washington D.C.: NDU Press, 1983), 14.

⁴⁷ "The Alliances New Strategic Concept," Communiqué of the NATO Heads of States and Government, Rome Summit Meeting, 7 December 1991, para 55.

⁴⁸ Ibid, para 57.

⁴⁹ Ibid.

⁵⁰Richard Paulsen, The Role of US Nuclear Weapons in the Post-Cold War Era, AUCADRE, (Maxwell AFB: AU Press, 1994), 29-36. According to Paulsen, Bush's initiatives ranged from the complete elimination of ground-launched nuclear weapons to the withdrawal of all TNWs from surface ships, attack submarines, and land-based naval aircraft. Whereas Gorbachev's initiatives ranged from the destruction of all nuclear artillery ammunition, warheads and removal of nuclear weapons from antiaircraft missiles to a similar removal of TNWs from its naval forces.

⁵¹ Steven Miller, "Western Diplomacy and the Soviet Nuclear Legacy," Survival, Vol. 34, No. 3, (Autumn 1992): 8-9.

⁵²Based on these announced reductions, Russia probably retains an operational stockpile of about 4,000 TNWs, plus an unknown reserve stockpile of stored TNWs. Michael Brown, "Phased Nuclear Disarmament and US Defense Policy," Occasional Paper, No. 30, (Washington D.C.: The Henry L. Stimson Center, October 1996): 5.

⁵³ Ibid, 5.

⁵⁴ Ibid, 5. See US Non-Strategic Nuclear Forces, (January 1991), in SIPRI Yearbook, 1991, 612. In sum, the US implemented a reduction of TNWs from approximately 6,000 to perhaps as many as 1,150 weapons.

⁵⁵Craig Cerniello, "France, Britain Retire Aging Nuclear Weapon Systems," News and Negotiations, Arms Control Today, (September 1996): 23. According to Cerniello, on September 16, 1996, France deactivated a total of 18 S3D nuclear missiles. This essentially eliminated France's land-based leg of its nuclear deterrent after 25 years of service. Additionally, the British will lose their air-breathing leg of their nuclear forces by the end of 1998, when the Royal Air Force retires 100 WE177 bombs carried on the Tornado aircraft.

⁵⁶ The Alliance's New Strategic Concept, para 8.

⁵⁷ Final Communiqué, Defense Planning Committee and Nuclear Planning Group, Press Communiqué M-DPC/NPG-2 (96) 173, 17 December 1996, para 9.

⁵⁸ NATO, NATO Fact Sheet: Responding to Proliferation, NATO Basic Fact Sheet No. 8, September 1996, 1.

⁵⁹ NATO Handbook, "The Alliances Strategic Concept: 7-8 November 1991," Ministerial Meeting of the North Atlantic Council, (Brussels, Belgium: NATO Office of Information and Press, 1995): 238.

⁶⁰ Jacquelyn Davis, Charles Perry, and Andrew Winner. "The Looming Alliance Debate over Nuclear Weapons." The Joint Forces Quarterly, No. 15 (Spring 1997): 82.

⁶¹ Pavel Felgengauer, "Russian Army and Military Balance Between East and West," Segodnya, RUSSICA Information Inc.-RusData Dialine-Russian Press Digest. Lexis Nexis: 18 August 1994.

⁶² Konstantin Sorokin, "Russia after the Crisis: The Nuclear Strategy Debate," Orbis, Vol. 38, No. 1 (Winter 1994): 25.

⁶³ Stephen Lambert and David Miller. "US Nuclear Weapons in Europe: The Current Environment and Prospects for the Future." MA Thesis. Naval Post Graduate School. (Monterey, CA: December 1996): 10.

⁶⁴ *Ibid.* 9.

⁶⁵ *Ibid.*

⁶⁶ William Potter, "Next Step in Nuclear Disarmament: The Challenge of Tactical Nuclear Weapons," Center for Nonproliferation Studies, Monterey Institute of International Studies. WEB Edition, Homepage.

⁶⁷ *Ibid.*

⁶⁸ *Ibid.*

⁶⁹ *Ibid.*

⁷⁰ Lambert and Miller, 14.

⁷¹ Oleg Bukharim, "Technical Aspects of Proliferation and Nonproliferation," in The Nuclear Challenge in Russia and the New States of Eurasia, ed., George Quester (Armonk: M.E. Sharpe, 1995), 46.

⁷² Testimony by John Deutch before the US Senate, as reported in the Security Issues Digest, US NATO Wireless File, European Wireless File No. 52, 21 March 1996, 9.

⁷³ For more information, see Bruce Blair, "Russian Control of Nuclear Weapons," in The Nuclear Challenge in Russia and the New States of Eurasia, ed. George Quester (Armonk: M.E. Sharpe, 1995), 47.

⁷⁴ Steven Zogga, "The CIS Nuclear Weapons Industry," Jane's Intelligence Review, Vol. 4, No. 9, (September 1992).

⁷⁵ Bruce Blair, "Russian Realities and the Illusion of Arms Control," The Christian Science Monitor (The Christian Science Publishing Society, 19 September 1995).

⁷⁶ Lambert and Miller, 19.

⁷⁷ Potter, William and David Fischer. "Nuclear Free: Better than NATO." Center for Nonproliferation Studies, Monterey Institute of International Studies. WEB Edition, Homepage or Los Angeles Times, 30 September 1996.

⁷⁸ John Deutch cited in Michael Boldrick, "The Nuclear Posture Review: Liabilities and Risks," Parameters, Vol. XXV, No. 4, (Winter 1996-96): 88.

⁷⁹ Lambert and Miller, 20-21.

⁸⁰ John Lepingwell, "Is START Stalling?" in The Nuclear Challenges in Russia and the New States of Eurasia, 102-103.

⁸¹ Associated Press, "Russia missing bombs says Ex-Chief of Security," The Kansas City Star, 5 September 1997, Sec. A-18.

⁸² Faye Flam, "No War, but 'Hair Trigger' a Worry: Nuclear Suitcase activation in '95 is cited as proof of danger, The Kansas City Star, 21 December 1997, Sec. A-27.

⁸³ Frank von Hippel, "Fissile Material Security in the Post-Cold War World," Physics Today, (June 1995): 27.

⁸⁴ Department of Defense, Office of the Secretary of Defense, Proliferation: Threat and Response, (April 1996): 44.

⁸⁵ Glenn Buchan, US Nuclear Strategy for the Post-Cold War Era, (Santa Monica, CA: The Rand Corp., 1994): 25.

⁸⁶ *Ibid.* 25.

⁸⁷ Gregory Schulte, "Responding to Proliferation: NATO's Role," in NATO Review, WEB Edition, Vol. 43, No. 4, July 1995.

⁸⁸ Department of Defense, Office of the Secretary of Defense, Proliferation: Threat and Response, (April 1996): 11.

⁸⁹ Final Communiqué, Defense Planning Committee and Nuclear Planning Group, Press Communiqué M-DPC/NPG-1 (95) 57, 8 June 1995.

⁹⁰ Jeffrey Larson, "NATO Counterproliferation Policy: A Case Study in Alliance Politics" INSS Occasional Paper 17, Institute for National Security Studies, (USAF Academy, CO.: November 1997): 1.

⁹¹ *Ibid.* 1-2.

⁹² *Ibid.* 2.

⁹³ Final Communiqué, Ministerial Meeting of the North Atlantic Council, Press Communiqué M-NAC-2 (96) 165, 10 December 1996, para 23.

⁹⁴ According to Larsen, there is no one uniform proliferation threat to NATO. Rather, the potential threats can be thought of in categories such as the following: opponents armed with WMD and delivery means in direct confrontation with NATO military forces in a regional setting; direct military threats by rogue states possessing WMD capabilities against the territory and populations of NATO states; risks from shifts in power balances with global implications that were created by acquisition of WMD or delivery means; regional instabilities that are fueled by proliferation of WMD and which negatively impact Western security; erosion of international norms and security systems; increased danger of accidents; and new avenues for international terrorism. Larsen, 7, 10.

⁹⁵ "Christopher Urges collective Action on Proliferation," Text of Statement in Luxembourg, United States Information Service (USIS), Wireless File, 10 June 1993.

⁹⁶ "Alliance Policy Framework on the Proliferation of WMD," NATO Review, (June 1994): 28-29.

⁹⁷ NATO Fact Sheet, 2, para a.

⁹⁸ *Ibid.* 2.

⁹⁹ *Ibid.* 2-3.

¹⁰⁰ Robert Joseph, "Proliferation, Counterproliferation and NATO," in Survival, Vol. 38, No. 1 (Spring 1996): 127.

¹⁰¹ Lambert and Miller, 40.

¹⁰² The issue of the irrational actor is valid, but will not be discussed at length. Shlomo Aronson provides an in-depth look on rational behavior by analyzing Thomas Schelling's work in the Strategy of Conflict. He viewed Schelling's work with the greatest of interest because of its explicit desire to construct an apolitical theory of conflict based on the notion of "rational behavior" of the partners in conflict. He goes on to note that this notion is complex and it requires the participants to be able to calculate profits and losses rationally in a situation in which they are dependent on each other's behavior. In terms of irrationality, Schelling characterizes it as "an unorganized and nonconsequent value system, faulty calculations, the inability to get information and pass it on, marginal and accidental influences over decisionmaking and over further transmission of decisions to others. Based on this characterization, he postulates that "small children and madmen, who are lacking the ability to behave in reasonably rational fashion, could not be deterred. Hence, their anticipated acts have to be preempted. Shlomo goes a step further to address the notion of "subjective rationality," a notion he felt Schelling left open. For example, ideological and domestic political considerations could be viewed as subjective rationalities, that is they could influence a conflict that could destroy both partners. Additionally, Shlomo points out another problem with Schelling's definitions on rationality and irrationality, in that they are only valid to states that share the same value systems. As a result, he goes further to question if these definitions are broad enough to encompass more complex situations between alien cultures and the cultures known to Schelling when he constructed his theory in the late 1950s. Therefore, one must carefully study cultural-historical, personal, and political factors in order to understand a country's behavior in regard to a response to a deterrent threat or in their potential use of NBC against another country or national interests abroad. Aronson and Brosh, 29-39.

¹⁰³ Rodney Jones, Small Nuclear Forces, (New York: Praeger Publishers, 1984), 62-63.

¹⁰⁴ It is imperative that the US show its resolve to the world that a threat to use, or use of NBC weapons against the US and its allies will not be tolerated, and clearly signal that their use would exact a devastating response. However, the US does not have to explicitly declare its intent. We must "be sensitive to the importance of balancing the need for clarity and credibility against the benefits of deliberate uncertainty and flexibility." "Nuclear weapons make it quite simple to create such uncertainty, amplifying as they do the well-established unpredictabilities of war as an instrument of state policy." Arguably, the policy of declining to state no first use worked well over the past 50 years and continues to work today as demonstrated by the US during the Gulf War, where the US concealed its intent to use nuclear weapons under the veil of ambiguity. Additionally, while putting the aggressor on notice, US ambiguity will allow for the development of a tailored response that best fits the situation. Kenneth Waltz argues, "the effectiveness of nuclear deterrence rests with uncertainty. Because no one can be sure that a major conventional attack on a nuclear country's vital interests will not escalate to the nuclear level, it is deterred. Uncertainty about controlling escalation is at the heart of deterrence. Jerome Kahn, Regional Deterrence Strategies for New Proliferation Threats, Institute for National Strategic Studies, National Defense University, Strategic Forum 70, (Washington: NDU Press, April 1996): 5. Barry Buzan, An Introduction to Strategic Studies, (New York: St. Martin's Press, 1987), 171-172. Scott Sagan and Kenneth Waltz, The Spread of Nuclear Weapons: A Debate, (New York: W. W. Norton & Company, 1995), 110.

¹⁰⁵ *Ibid.*

¹⁰⁶ Robert Joseph, "The Impact of NBC Proliferation on Doctrine and Operations," The Joint Force Quarterly, No. 13 (Autumn 96): 80.

¹⁰⁷ National Defense University, "Proliferation," Strategic Assessment 1997, (Wash, D.C.: NDU Press, 1997).

¹⁰⁸ Glenn Buchan, US Nuclear Strategy for the Post-Cold War Era, (Santa Monica, CA: The Rand Corp., 1994), 11.

¹⁰⁹ Buchan, 12.

¹¹⁰ *Ibid.*

¹¹¹ *Ibid.*, 11.

¹¹² *Ibid.*

¹¹³ Jack Mendelson and Craig Cerniello, "Arms Control Agenda at the Helsinki Summit," Arms Control Today (March 1997): 17.

¹¹⁴ "Arms Control and the Helsinki Summit: Issues and Obstacles in the Second Clinton Term," Arms Control Today (March 1997): 12.

¹¹⁵ Lambert and Miller, 147.

¹¹⁶ Viktor Mikhailov, "NATO's Expansion and Russia's Security," The Nuclear Roundtable, (Wash D.C.: The Henry L. Stimson Center, 19 February 1998): 2.

¹¹⁷ Catherine Kelleher and Kenneth Myers, "Nuclear Deterrence and European Security," Institute for National Strategic Studies, National Defense University, Washington D.C.: NDU Press, 1997, WEB Edition, Chapter 7.

¹¹⁸ *Ibid*

¹¹⁹ Nikolai Sokov, "Tactical Nuclear Weapons Elimination: Next Steps for Arms Control." The Nonproliferation Review, Volume 4, No. 2, Monterey Institute of International Studies (Winter 1997): 13.

¹²⁰ *Ibid.*

¹²¹ *Ibid.*, 14.

¹²² Alexander Downer, "Report of the Canberra Commission on the Elimination of Nuclear Weapons, 14 August 1996, Annex on Verification.

¹²³ The Alliance's New Strategic Concept, para 57.

¹²⁴ Lambert and Miller, 110.

¹²⁵ Karl Kaiser, "From Nuclear Deterrence to Graduated Conflict Control," Survival, Vol. 32 (November/December): 483-496.

¹²⁶ Lambert and Miller, 110.

¹²⁷ Andrew Goodpaster, 'New Priorities for US Security: Military Needs and Tasks in a Time of Change,' Occasional Paper. (Washington D.C.: The Atlantic Council of the United States, June 1991): 15.

¹²⁸ David Buckley, "Implications of INF Arms Control Reductions for the TLAM/N Cruise Missile and the Maritime Strategy," MA Thesis. Naval Post Graduate School, (Monterey, CA: December 1987): 88.

¹²⁹ Duncan Lennox, ed. "Jane's Strategic Weapons Systems," (UK: Jane's Information Group Ltd.), issue 20.

¹³⁰ For a detailed argument on the conventional deterrence resuming its place at the center of US national security policy see Hooker and Wadell, "The Future of Conventional Deterrence," 78-89.

¹³¹ *Ibid.* 35.

¹³² *Ibid.*

¹³³ Jacquelyn Davis, Charles Perry, and Andrew Winner, 81.

¹³⁴ *Ibid.*

¹³⁵ *Ibid* 82.

¹³⁶ Canberra Commission, "Report of the Canberra Commission on the Elimination of Nuclear Weapons," Arms Control Today (August 1996): 38.

¹³⁷ *Ibid.* 18.

¹³⁸ Zachary Davis points out that with one NWFZ already in force banning nuclear weapons from Latin America and the Caribbean (the Treaty of Tlateleco), and the NWFZ for Africa (the Pelindaba Treaty) and Southeast Asia soon to implemented, it appears that nuclear weapons are becoming irrelevant to the security calculations of all but a few countries. A key element in the process of establishing these zones is security perceptions, in that security perceptions of sovereign nations are foremost in determining participation in NWFZs. Moreover, to reach their full potential, NWFZs must accommodate existing security relationships, respect the right of free transit for military ships and submarines and avoid directly challenging the vital interests of the great powers. A concern about transit rights has been a major impediment for US policy toward NWFZs. These concerns were realized in 1980 when New Zealand enforced a policy not to allow port visits by US Navy ships, which according to US policy, neither confirm or deny the presence of nuclear weapons. According to Davis, New Zealand's policy was not required by its membership in the South Pacific Nuclear-Weapon-Free Zone (SPNFZ), but it reinforced the perception that SPNFZ was not only anti-nuclear, but anti-US as well. And it is exactly these kinds of perception that could hinder future US participation in these zones. Zachary Davis, "The Spread of Nuclear-Weapon Free Zones: Building a New Nuclear Bargain," Arms Control Today (February 1996): 15. Zachary Davis is a specialist in international nuclear policy at the Congressional Research Service in the Library of Congress. The views expressed in his article are his own.

¹³⁹ *Ibid.* 15.

¹⁴⁰ Jan Rivenburg, 66-71.

¹⁴¹ Since the mid-'50s there have been literally dozens of proposals for NWFZs in the Nordic region, the Baltic States, Central Europe, and the Balkans.

¹⁴² Jan Rivenburg, "Implications of Nuclear Weapon Free Zones in the International System." MA Thesis, Naval Post Graduate School, (Monterey CA: December 1988): 79-80.

¹⁴³ Joseph O'Neill, The Validity of US Criteria for Nuclear Weapon Free Zones, The National War College, National Defense University, (Washington D.C.: February 1986): 13-14.

¹⁴⁴ Potter and Fischer, 2.

¹⁴⁵ Zachary Davis, 15.

¹⁴⁶ Ibid, 16.

¹⁴⁷ Ibid.

¹⁴⁸ Ibid, Davis provides an example by noting the problems experienced with SPNFZ. Although SPNFZ satisfied the criteria, the Reagan Administration shunned it because of the larger message US participation would have conveyed. In his view both critics and supporters of NWFZs agree that the spread of such zones signifies the gradual marginalization of nuclear weapons in international security.

¹⁴⁹ Joseph O'Neill, The Validity of US Criteria for Nuclear Weapon Free Zones, The National War College, National Defense University, (Washington D.C.: February 1986): 9.

¹⁵⁰ Jan Marten Van Tol, "Naval Arms Control is not in the Soviet Interest." Naval War College, (New Port RI: 22 June 1990): 9.

¹⁵¹ "The Forum: Online Nuclear Futures Forum," Electronic Conference on the Utility of Nuclear Weapons (Washington D.C.: The Henry L. Stimson Center, 23-27 June 1997), summary.

¹⁵² Buchan, 54.

Bibliography

Books

Aronson, Shlomo and Oded Brosh. The Politics and Strategy of Nuclear Weapons in the Middle East: Opacity Theory and Reality, 1960-1991, and Israeli Perspective. New York: State University of New York Press, 1992.

Bacevich, A.J. The Pentomic ERA: The US Army between Korea and Vietnam. Washington D.C.: National Defense University Press, 1986.

Ball, Desmond. "The Development of the SIOP, 1960-1983," in Strategic Nuclear Targeting. ed. Desmond Ball and Jeffrey Richelson. Ithaca and London: Cornell University Press, 1986.

Barnaby, Frank and Geoffrey Thomas, ed. The Nuclear Arms Race: Control or Catastrophe. New York: St. Martins Press, 1982.

Blair, Bruce. "Russian Control of Nuclear Weapons" in The Nuclear Challenge in Russia and the New States of Eurasia. ed. George Quester. Armonk: M.E. Sharpe, 1995.

Bluth, Christoph. The Collapse of the Soviet Military Power. Brookfield: Dartmouth Publishing Company, 1995.

Boutwell, Jeffrey, Paul Doty, and Gregory Treverton, ed. The Nuclear Confrontation in Europe. London: Croom Helm LTD., 1985.

Bukharim, Oleg. "Technical Aspects of Proliferation and Nonproliferation" in The Nuclear Challenge in Russia and the New States of Eurasia. ed. George Quester. Armonk: M.E. Sharpe, 1995.,

Buteux, Paul. The Politics of Nuclear Consultation in NATO-1965 to 1980. Cambridge University: Cambridge University Press, 1983.

Buzan, Barry . An Introduction to Strategic Studies. New York: St. Martin's Press, 1987.

Campbell, Christopher. Nuclear Weapons Handbook. Presidio, CA: Presidio Press, 1984.

Cimbala, Stephen. NATO Strategy and Nuclear Escalation. New York: St. Martin's Press, 1989.

Citron Thomas, William Arkin and Milton Hoenig, Nuclear Weapons Handbook. Vol. 1. US Nuclear Forces and Capabilities. Natural Resources Defense Council Inc. Cambridge, MA: Ballinger Publishing Co, 1984.

Cohen, S. T. and William Van Cleave. Tactical Nuclear Weapons: An Examination of the Issues. New York: Crane, Russak & Company Inc., 1978.

Creveld, Martin van. Nuclear Proliferation and the Future of Conflict. New York: The Free Press, 1993.

Dulles, John Foster. "Policy for Security and Peace," in John Endicott and Roy Stafford Jr. ed. American Defense Policy. Fourth Edition. Baltimore, Md.: John Hopkins University Press, 1977.

Freedman, Lawrence. The Evolution of Nuclear Strategy. New York: St. Martin's Press, 1983.

Garrity, Patrick and Steven Maaranen, ed. Nuclear Weapons in the Changing World: Perspectives from Europe, Asia, and North America. New York: Plenum Press, 1992.

George, Alexander and Richard Smoke. Deterrence in American Foreign Policy: Theory and Practice. New York: Columbia University Press, 1974.

Jervis, Robert. The Illogic of American Nuclear Strategy. Ithaca: Cornell University Press, 1984.

Jones, Rodney, ed. Small Nuclear Forces and US Policy: Threats and Potential Conflicts in the Middle East and South Asia. Georgetown: Georgetown University, The Center for Strategic and International Studies, 1984.

Jones, Rodney. Small Nuclear Forces. New York: Praeger Publishers, 1984.

Kaufmann, William Kaufmann "The Requirements of Deterrence," in William Kaufmann, ed. Military Policy and National Security. Princeton: Princeton University Press, 1956.

Kelleher, Catherine. Germany and the Politics of Nuclear Weapons. Columbia University Press, 1975.

Lewis, George. "The Future of US Nonstrategic Nuclear Forces." in Michelle Flournoy, ed. Nuclear Weapons After the Cold War. New York: Harper Collins, 1993.

Paulsen, Richard. The Role of US Nuclear Weapons in the Post-Cold War Era. AUCADRE, Maxwell AFB: AU Press, 1994.

Ramsbotham, Oliver. Choices: Nuclear and Non-Nuclear Defense Options. London: Brassey's Defense Publishers Ltd., 1987.

Record, Jeffrey. NATO's Theater Nuclear Force Modernization Program: The Real Issues. Washington, D.C.: Corporate Press, Inc., 1981.

_____. US Nuclear Weapons in Europe. Washington: The Brookings Institution, 1974.

Sagan, Scott and Kenneth Waltz. The Spread of Nuclear Weapons: A Debate. New York: W. W. Norton & Company, 1995.

Schelling, Thomas. Arms and Influence. New Haven, CN: Yale University Press, 1996.

_____. The Strategy of Conflict. Cambridge, Mass.: Harvard University Press, 1960.

Schlesinger, James. "Flexible Strategic Options," in John Endicott and Roy Stafford Jr. ed. American Defense Policy. Fourth Edition. Baltimore, Md.: John Hopkins University Press, 1977.

David Tarr. Nuclear Deterrence and International Security: Alternative Nuclear Regimes. New York: Longman Publishing Group, 1991.

Reports, Studies, Theses, Dissertations, and Monographs

Arkin, William. "Nuclear Weapons: A No-First-Use Doctrine Exists for All Non-Nuclear States." F. A. S. Public Interest Report, Journal of the Federation of American Scientists (FAS), Vol. 47, No. 5 (September/October 1994): 1-10.

Brown, Michael. "Phased Nuclear Disarmament and US Defense Policy." Occasional Paper, No. 30. Washington D.C.: The Henry L. Stimson Center, October 1996.

Bryan, Ian Bates. "US Policy and Doctrine regarding Nuclear Force in Regional Contingencies: Tactical Expediency could threaten Strategic Aims." MA Thesis. Air Force Institute of Technology - Ohio State University. Wright-Patterson AFB, OH: 1993.

Booker, David. Theater Nuclear Forces and Extended Deterrence in a Multipolar World. AUCADRE Paper - Special Series Report, No. AU-ARI-CPSS-91-16. Maxwell AFB, AL: AU Press, June 1992, 45-67.

Buchan, Glenn. US Nuclear Strategy for the Post-Cold War Era. Santa Monica, CA: The Rand Corp., 1994.

Buckley, David. "Implications of INF Arms Control Reductions for the TLAM/N Cruise Missile and the Maritime Strategy." MA Thesis. Naval Post Graduate School. Monterey, CA: December 1987.

Carpenter, Robert. The Role of Theater Nuclear Forces. US Army War College. Carlisle Barracks, P. A.: 31 December 1985.

Clayton, Charles. An Analysis of the MLF as a Solution to NATO's Nuclear Political Problem. US Army War College. Carlisle Barracks, PA.: 8 April 1966

Debouzy, Oliver, Nicholas Witney, and Robert Levine. Western European Nuclear Forces: A British, a French, and an American View. Santa Monica, CA: The Rand Corp., 1995.

Downer, Alexander. "Report of the Canberra Commission on the Elimination of Nuclear Weapons. 14 August 1996.

Friedberg, Aeron. "A History of the US Strategic Doctrine 1945-1970." Military Strategy National Security Management Series. National Defense University. Wash, D.C.: NDU Press, May 1983.

Goodpaster, Andrew. "An Evolving US Nuclear Force Posture." Second Report of the Steering Committee Projecting on Eliminating Weapons of Mass Destruction. Report No. 19. Washington D.C.: The Henry L. Stimson Center, December 1995.

_____. "Nuclear Weapons and European Security." Policy Paper. Washington D.C.: The Atlantic Council of the United States, April 1996.

_____. "New Priorities for US Security: Military Needs and Tasks in a Time of Change." Occasional Paper. Washington D.C.: The Atlantic Council of the United States, June 1991.

Gordan, Keith. "The King's Silver Bullet -- Is there still a Need?" Monograph. School of Advanced Military Studies, US Army Command and General Staff College. Ft. Leavenworth, KS: First Term 88-89.

Kahn, Jerome. Regional Deterrence Strategies for New Proliferation Threats. Institute for National Strategic Studies. National Defense University. Strategic Forum 70. Washington: NDU Press, April 1996.

Keating, Arthur. The Utility of Tactical Nuclear Weapons following 1990 CFE Reduction Agreement. US Army War College. Carlisle Barracks, PA.: June 1991.

Kelleher, Catherine and Kenneth Myers. "Nuclear Deterrence and European Security." Institute for National Strategic Studies. National Defense Universit. Washington D.C.: NDU Press, 1997. WEB Edition. Chapter 7.

Lambert, Stephen and David Miller. "US Nuclear Weapons in Europe: The Current Environment and Prospects for the Future." MA Thesis. Naval Post Graduate School. Monterey, CA: December 1996.

Larson, Jeffrey. "NATO Counterproliferation Policy: A Case Study in Alliance Politics." INSS Occasional Paper 17. Institute for National Security Studies. USAF Academy, CO.: November 1997.

Legge, Michael. Theater Nuclear Weapons and the NATO Strategy of Flexible Response. Monterey, CA: The Rand Corp, 1983.

Libicki, Martin. "Information & Nuclear RMAs Compared." Strategic Forum, No. 82. Institute for National Strategic Studies. National Defense University. Washington D.C.: NDU Press, July 1996.

Malloy, Todd. "Why the US Should Negotiate a Ban on Naval Tactical Weapons." MA Thesis. Naval Post Graduate School. Monterey CA: December 1991.

Marten Van Tol, Jan. "Naval Arms Control is not in the Soviet Interest." Naval War College, New Port R.I.: 22 June 1990.

Mikhailov, Viktor. "NATO's Expansion and Russia's Security." The Nuclear Roundtable. Wash D.C.: The Henry L. Stimson Center, 19 February 1998.

Millit, Marc, Roger Molander, and Peter Wilson. "The Day After..." Study: Nuclear Proliferation in the Post Cold War World. Summary Report, Vol. 1. The Rand Corp., Monterey, CA: July 1994.

Minnet, Donald. "Weapons of Mass Destruction in the Developing World: Will Deterrence still Work? What are the Operational Options?" Naval War College, Newport R. I.: 19 June 1992.

O'Neill, Joseph. The Validity of US Criteria for Nuclear Weapon Free Zones. The National War College. National Defense University, Washington D.C.: February 1986.

Owens, Gregory. "Chinese Tactical Nuclear Weapons." MA Thesis. Naval Post Graduate School. Monterey, CA: June 1996.

Reed, Jean. "NATO's Theater Nuclear Forces: A Coherent Strategy for the 1980's." National Security Affairs Monograph Series 83-8. National Defense University. Washington D.C.: NDU Press, 1983.

Rivenburg, Jan. "Implications of Nuclear Weapon Free Zones in the International System." MA Thesis. Naval Post Graduate School. Monterey CA: December 1988.

Stanton, Lowell. "US/NATO Sea-based Non-strategic Nuclear Deterrence: Paradox or Pitfall?" MA Thesis. Naval Post Graduate School. Monterey, CA: September 1991.

Stobbs, Emmett Jr. Is there a Future Role for Tactical Nuclear Weapon Systems in the National Military Strategy? US Army War College. Carlisle Barracks, PA.: April 1992.

Schwartz, David. NATO's Nuclear Dilemmas. The Brookings Institution, 1983.

Torrens, Linda. "The Future of NATO's Tactical Air Doctrine." Thesis. School of Advanced Airpower Studies, Air University. Maxwell AFB, AL: AU Press, August 1997, 31-41.

Tunstall, Stan. Tactical Nuclear Weapons in the Post Cold War Era: Implications for the Operational Commander. Naval War College. Newport, R. I.: 18 June 1995.

Van Tol, Jan Marten. "Naval Arms Control is not in the Soviet Interest." Naval War College. (New Port R.I.: 22 June 1990.

Vokac, Robert. "Smart Weapons - Can We Fold the Nuclear Umbrella?" Monograph. School of Advance Military Studies, US Army Command and General Staff College. Ft. Leavenworth, KS: First Term 91-92.

Articles

Arkin, William. "Agnosticism When Real Values are Needed: Nuclear Policy in the Clinton Administration." F.A.S. Public Interest Report. Journal of the Federation of American Scientists, Vol. 47, No. 5 (September/October 1994): 3-10.

"Arms Control and the Helsinki Summit: Issues and Obstacles in the Second Clinton Term." Arms Control Today (March 1997): 9-15.

Aron, Raymond. "Why Europe Fears Us." The Atlantic. Vol. 214. (December 1964).

Associated Pres. "Russia missing bombs says Ex-Chief of Security." The Kansas City Star. 5 September 1997. Sec. A-18.

Associated Press. "US Image: A Mad Dog with Nukes." Washington Times, 2 March 1998, 13.

Binnendijk, Hans and Patrick Clawson. "Tuning the Instruments of National Power." The Joint Force Quarterly, No. 10 (Winter 95-96): 82-88.

Blair Bruce. "Russian Realities and the Illusion of Arms Control" in the The Christian Science Monitor The Christian Science Publishing Society (19 September 1995).

Borchgrave, Arnaud. "The Soviets were targeting European NATO Allies with Nuclear Weapons." Washington Times, 24 March 1998, 18.

Brown, Michael. "Phased Nuclear Disarmament and US Defense Policy." Occasional Paper. No. 30. Washington D.C.: The Henry L. Stimson Center, October 1996.

Burns, Williams. "The Future of US Nuclear Weapons Policy." Executive Summary of the National Academy of Sciences Report. Arms Control Today (May 1997): 14-18.

Canberra Commission. "Report of the Canberra Commission on the Elimination of Nuclear Weapons." Arms Control Today (August 1996): 35-38.

Cerniello, Craig. "France, Britain Retire Aging Nuclear Weapon Systems." News and Negotiations. Arms Control Today (September 1996): 23.

_____. "Retired Generals Re-Ignite Debate over Abolition of Nuclear Weapons." News and Negotiations. Arms Control Today (November/December 1996): 14-15.

_____. "US, Russian Officials Voice confidence in Russian Control of Nuclear Forces." Arms Control Today (May 1997): 28.

Chavez, Linda. "Sex Scandal puts NATO Expansion on hold indefinitely in Washington." Baltimore Sun. 25 March 1998, 17.

Collins, A.S., Jr. "Tactical Nuclear Weapons: Are they a Real Option." US Army Magazine (July 1982): 36-39.

Davis, Jacquelyn, Charles Perry, and Andrew Winner. "The Looming Alliance Debate over Nuclear Weapons." The Joint Forces Quarterly, No. 15 (Spring 1997): 80-86.

Davis, Zachary. "The Spread of Nuclear-Weapon Free Zones: Building a New Nuclear Bargain." Arms Control Today (February 1996): 15-19.

Deutch, John. Cited in Michael Boldrick, "The Nuclear Posture Review: Liabilities and Risks." Parameters. Vol. XXV. No. 4. (Winter 1996-96): 84-90.

Dryer, Frank. "End of an Era for Army Tactical Nuclear Weapons." Ordnance, (February 1993): 10-11.

Dulles, John Foster. "The Evolution of Foreign Policy." Department of State Bulletin Vol. 30. 25 January 1954.

"Estimated Russian Nuclear Stockpile, September 1996." The Bulletin of Atomic Scientists (September/October 1996): 63.

Felgengauer, Pavel. "Russian Army and Military Balance Between East and West." Segodnya. RUSSICA Information Inc.-RusData Dialine-Russian Press Digest. Lexis Nexis: 18 August 1994.

Fitzgerald, Mary. "The Russian Image in Future War." Comparative Strategy 13 (1994): 173.

Flam, Faye. "No War, but 'Hair Trigger' a Worry: Nuclear Suitcase activation in '95 is cited as proof of danger." The Kansas City Star. 21 December 1997. Sec. A-27.

Gertzen Jason. "START II's OK Seen: Russian General Supports Even Deeper Cuts." Omaha World Harold, 21 March 1998, 1.

Habiger, Eugene. "Strategic Forces for Deterrence." The Joint Force Quarterly, No. 14 (Winter 96-97): 64-69.

Hoffman, David. "Shattered Shield: The Decline of Russia's Nuclear Forces." One of two articles. Washington Post, 15 March 1998, 1.

_____. "Shattered Shield: The Decline of Russia's Nuclear Forces." Second of two articles. Washington Post, 16 March 1998, 1.

Hooker, Richard and Ricky Waddell. "The Future of Conventional Deterrence." Naval War College Review, (Summer 92): 78-89.

Holdren, John. "Reducing the Threat of Nuclear Theft in the Former Soviet Union." Arms Control Today (March 1996): 14-20.

Isaacs, John. "Arms Control and the 105th Congress." Arms Control Today (November/December 1996): 10-13.

Johnson, Mark. "Nukes and the Russian Mob." The Journal of Commerce (13 March 1998): 6.

Joseph, Robert. "The Impact of NBC Proliferation on Doctrine and Operations." The Joint Force Quarterly, No. 13 (Autumn 96): 74-80.

Kaiser, Karl. "From Nuclear Deterrence to Graduated Conflict Control." Survival. Vol. 32. (November/December): 483-496.

Laurenzo, Ronald. "NATO Expansion could make Russia go Nuclear: Military Forces feel threatened by Former Allies." Washington Times, 22 March 1998, 8.

Medeiros, Evan. "Theater Ballistic Missile Systems and Capabilities." Factfile. Arms Control Today (March 1996): 29-30.

Mendelson, Jack. "START II and Beyond." Arms Control Today, (October 1996): 3-9.

Mendelson, Jack and Craig Cerniello. "Arms Control Agenda at the Helsinki Summit." Arms Control Today (March 1997): 16-21.

Miller, Steven. "Western Diplomacy and the Soviet Nuclear Legacy." Survival, Vol. 34, No. 3, (Autumn 1992): 8-9.

National Academy of Sciences (NAS) Committee on International Security and Arms Control (CISAC). "The Future of US Nuclear Weapons Policy." Arms Control Today. Executive Summary of the NAS report (May 1997): 14-18.

National Defense University. "Countering Weapons of Mass Destruction." Strategic Assessment 1996 (Wash, D.C.: NDU Press, 1996): 201.

"New US-Russian Arms Control Talks Imminent." Jane's Defence Weekly, (11 March 1998): 3.

Nitze, Paul. "The Relationship of Strategic and Theater Nuclear Forces." International Security, Vol. 2, (Fall 1977). 122.

NRDC "Nuclear Notebook." The Bulletin of Atomic Scientists, (November/December 1995).

_____. "US Nuclear Stockpile July 1997." The Bulletin of Atomic Scientists, (July/August 1997).

_____. "Where the Bombs Are - 1997." The Bulletin of Atomic Scientists, (September/October 1997).

_____. "Global Nuclear Stockpiles 1945-1997." The Bulletin of Atomic Scientists, (November/December 1997).

O'Donell, Brendan. "No First Use." Naval War College Review, (Winter 1992): 45-53.

Potter, William. "Next Step in Nuclear Disarmament: The Challenge of Tactical Nuclear Weapons." Center for Nonproliferation Studies, Monterey Institute of International Studies. WEB Edition, Homepage.

_____. "Nuclear Insecurity In the Post-Soviet States." The Nonproliferation Review, Vol. 1 - No. 3. Monterey Institute of International Studies (Spring-Summer 1994).

_____. "Nuclear Leakage from the Post-Soviet States." Oral presentation before the Permanent Subcommittee on Investigations, US Senate Committee on Governmental Affairs. The Center for Nonproliferation Studies. Monterey C.A.: Monterey Institute of International Studies (13 March 1996).

Potter, William and David Fischer. "Nuclear Free: Better than NATO." Center for Nonproliferation Studies, Monterey Institute of International Studies. WEB Edition, Homepage.

Richardson, Robert III. "NATO Nuclear Strategy: A Look Back," Strategic Review, Vol. 9, No. 2, (Spring 1981).

Roth, William Jr. "Enlarge NATO for a More Stable Europe." Washington Post, 24 March 1998, 18.

"Russia's Answer to Expansion of NATO." Power in Russia: Russian Executive and Legislative Newsletter, No.'s 22-28 (June 1996).

Sokov, Nikolai. "Tactical Nuclear Weapons Elimination: Next Steps for Arms Control." The Nonproliferation Review, Volume 4, No. 2, Monterey Institute of International Studies (Winter 1997).

Sorokin, Konstantin. "Russia after the Crisis: The Nuclear Strategy Debate." Orbis, Vol. 38, No. 1 (Winter 1994).

Schulte, Gregory. "Responding to Proliferation: NATO's Role" in NATO Review, WEB Edition, Vol. 43, No. 4, July 1995.

"The Military Balance 1974/75." The International Institute for Strategic Studies, reprinted in Air Force Magazine, Vol. 57, (December 1974).

von Hippel, Frank. "Fissile Material Security in the Post-Cold War World." Physics Today, (June 1995): 24-29.

Williams, Michael. "A Start to START III: Advancing the Arms Control Process." IISS Strategic Comments, Vol. 3, No. 4. International Institute for Strategic Studies. London: Albert Stellan Ltd. (May 1997).

Zologa, Steven. "The CIS Nuclear Weapons Industry." Jane's Intelligence Review, Vol. 4, No. 9, (September 1992).

Other Publications/Documents

"Christopher Urges collective Action on Proliferation." Text of Statement in Luxemburg. United States Information Service (USIS). Wireless File. 10 June 1993.

Department of Defense, Office of Secretary of the Air Force. Nuclear Operations. Air Force Doctrine Document 23. 26 August 1994.

Department of Defense. JCS. National Military Strategy of the United States of America. Washington: US Government Printing Office, 1996.

Department of Defense. JCS Joint Pub 1-02. Department of Defense Dictionary of Military and Associated Terms. 1 May 1997.

Department of Defense. JCS Pub 3-12. Doctrine for Joint Nuclear Operations. 18 December 1995.

Department of Defense. JCS Pub 3-12.1. Doctrine for Joint Theater Nuclear Operations. 9 February 1995.

Department of Defense. Office of the Secretary of Defense. Proliferation: Threat and Response. Washington: US Government Printing Office, April 1996.

Department of Defense. Office of the Secretary of Defense. Proliferation: Threat and Response. Washington: US Government Printing Office, April 1997.

Final Communiqué. Defense Planning Committee and Nuclear Planning Group, Press Communiqué M-DPC/NPG-1 (96) 88, 13 June 1996.

Final Communiqué. Ministerial Meeting of the North Atlantic Council, Press Communiqué M-NAC-2 (96) 165, 10 December 1996.

Final Communiqué. Defense Planning Committee and Nuclear Planning Group, Press Communiqué M-DPC/NPG-2 (96) 173, 17 December 1996.

Mikhailov, Viktor. "NATO's Expansion and Russia's Security." The Nuclear Roundtable, Wash D.C.: The Henry L. Stimson Center. 19 February 1998.

NATO. NATO Fact Sheet: Responding to Proliferation. NATO Basic Fact Sheet No. 8, September 1996.

NATO Handbook. "The Alliances Strategic concept: 7-8 November 1991." Ministerial Meeting of the North Atlantic Council. Brussels, Belgium: NATO Office of Information and Press, 1995.

Savage, William. "Strategy Implications of SDI," in Essays on Strategy IV. by National Defense University. Wash D.C.: NDU Press, 1987.

Testimony by John Deutch before the US Senate, as reported in the Security Issues Digest. US NATO Wireless File. European Wireless File No. 52. 21 March 1996.

"The Alliances New Strategic Concept," Communiqué of the NATO Heads of States and Government, Rome Summit Meeting, 7 December 1991.

"The Forum: Online Nuclear Futures Forum." Electronic Conference on the Utility of Nuclear Weapons. Washington D.C.: The Henry L. Stimson Center, 23-27 June 1997.

The Modernization of NATO's Long Range Theater Nuclear Forces. Report prepared for the Subcommittee on Europe and the Middle East of the Committee on Foreign Affairs of the US House of Representatives. Congressional Research Service. US Government Printing Office, 1981.

US Army. Field Manual 100-30. Nuclear Operations. Washington D.C.: Department of the Army. September 1995

US Executive Branch. A National Security Strategy of Engagement And Enlargement. Washington: US Government Printing Office, February 1996.

Weinrod, W. Bruce. ed. "Assessing Strategic Defense -- Six Roundtable Discussions." The Heritage Lectures #38. The Heritage Foundation (1985)